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Alberta COAL TRUTHS



MINE DISTRICTS
ANALYSES
TRADE NAMES
COAL CHARACTERISTICS
GENERAL INFORMATION

Alberta Government Coal Truth Office

WINNIPEG, MAN.

By GEO. R. PRATT, A.M.E.I.C.
Fuel Engineer

No. 27

Best of Mines

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SCIENTIFIC JOURNAL

AUTHOR'S NOTE

Winnipeg, Man.,

June 15th, 1926.

IN producing the following pages the author has had in mind the various problems that have been put to him over the last few years by the consumer, the coal dealer, and the coal producer. It is hoped that they will help the consumer to intelligently compare offered values and descriptions with the standards which are usual for the particular class of coal; that it will help the coal salesman to check values of certain classes of coal which are offered to him to sell, and to be able to intelligently talk to the coal consumer on the consumers' problems; and that it will assist the coal producer in arriving at the standard of qualifications which his coal must have in order to suit the consumers' conditions and meet competition.

From the consumer's standpoint and for his own benefit, he should have a more sympathetic viewpoint towards those to whom he looks to produce and supply him with the coal. Coal, to him, is often a derided product, and talked of and looked at with a more or less contemptuous attitude. Its usage helps this viewpoint. It is not good to look at. It is dirty in handling; it requires some work from the user, and has to be paid for with money that he thinks would bring in more pleasure if expended in other directions; and finally, on checking up at the end of the season, he has nothing to show for his money but a pile of ashes. These lead to the thought that it is money wasted anyway, and so he searches around for the man that apparently offers him the most for his money; that in proving the value of the offer when the purchase is made, demands destroying the evidence (burning the coal) is not taken into account, except to blame all in the trade of selling coal for his "own" shortcomings.

Coal lends itself readily to misrepresentation and substitution. The consumer cannot check it by appearance beforehand, consequently he should, to protect himself, pass the responsibility to someone else. That someone else should logically be the coal dealer and the coal producer. The reliable coal dealer, or I should say the established coal dealer, is one that is in the coal business to stay, he cannot stay if he does not maintain his customers. Therefore, from a consumer's point of view the established dealer has more to gain by playing the game than he can possibly make by not

doing so. He is in a more favored condition to sell coal service at the lowest possible price than is an intermittent coal peddler or (winter snowbird). When the consumer finds that the established dealer's price is apparently higher than the snowbird's price for the same offered article, he should remember that the price of a certain selected brand of coal is the same to all dealers, that the freight rate is the same to all dealers, that the cost of cartage, the cost of screening out the small, and office expenses is the same to all or less with the established dealer. Under such circumstances the purchaser of coal probably gets just what he pays for in those problematical B.T.U.'s, and loses in service by the difference in the domestic virtues of the substituted coal.

Larger buyers of coal may think that they are in a favored position on account of the precautions which they take in checking for value, but from the writer's observation they pay in the same way as do the small consumer.

Buying and selling coal is not like business in any other commodity. The worst looking coal may be the best for the purpose required and the best looking may be the worst. Consequently the buyer and seller must be able to realize and to prove the other virtues of the product in order to play the game one with the other. In the past the standard used has been based upon work done by a scientific expert under the most perfect of test conditions, who says that if you fulfil certain conditions under expert supervision you can obtain so many B. T. U.'s.

This is all right when comparing the B. T. U.'s with the same coal from the same mine, but the other characteristics of every other coal are different one from another.

The writer has often put this question to some dealer, "Are you tendering on so and so contract?" to be met with the reply, "I may do so in order to keep my name on his books, but what's the use? It will be bought on price and a B. T. U.'s guarantee. I can comply with the guarantee but not come near the prices that will be offered and accepted."

In any deal in commodities other than coal it is understood by either party, buyer or seller, that each expects the other to "play the game" as per the "intention."

By accepting contracts for the supply of coal at a price which it is known the seller cannot provide it for, and to permit the seller to supply coal by paying the penalty for lower B.T.U. only, makes the purchaser party to any attempted fraud which may take place in the deal. The purchaser expects to put it over the contractor by means of close check and penalties, and the contractor to stay in

business must intend to put it over the purchaser by substitution or short weight.

Substitution is easy when the check is for B.T.U.'s only on Bituminous slack coals. The contract may call for 13,000 B.T.U. coal with a penalty in proportion for lower B.T.U.'s. By-product sub-bituminous slacks around 10,500 B.T.U.'s can be obtained at from 2 to 3 dollars per ton less than the 13,000 coal. Mixing one ton of 10,500 to every two tons of 13,000 will permit of a good profit to the dealer on the transaction after paying the penalty.

The purchaser is often gleeful at his skill in checking up the contractor, but he takes the loss in extra coal burned and a higher price paid per ton than if he had called for his tenders on the mixture.

If, in addition to the B.T.U. check, the purchaser permitted his engineer to check it by examination of a sample of the coal with a magnifying glass, and by burning a small sample for its caking qualities, and for the fireman to state its action in the fire, a better check for value received would result than on a B.T.U. test only.

Where Black Lignite slack, or sub-bituminous slack, is mixed with a slow burning coal, the substituted coal will appear to have glowing spots in the fire and an appearance of sparking. In favor of the substitution is the fact that it improves the firing qualities by making it easier for the fireman to handle his fire, through it being freer burning. But, why should the fireman kick? He doesn't pay for the coal and is often not in a position to know that he burns more.

Opposed to the opinion of the coal buyer is the complaint of the established coal dealers that the public do not give them fair consideration. The dealers are probably right, but I have not seen any real effort on the part of the dealers to put their case intelligently before the public. The public are human and have their own viewpoint. How are they to realize the difficulties of the coal dealer if they are not advised of them?

The public buyer expects coal when he wants it, as he wants it, and in the condition that he wants it, and at the lowest possible price. To conform with this the established dealer must line up with a class of coal which will meet with the approval of his customers, keep a stock on hand at the vagaries of the weather man and the whim of the customer, have a raft of teams in the stable eating their heads off while the dealer prays for a cold snap to pay for their "grub," and when the snap comes works them day and night shipping half ton and one ton lots for miles outside his specific territory, to their own and their competitor's customers who have neglected to use ordinary "common sense."

Laws have been established which say that the coal dealer must do so and so. The consumer complains that the laws are not

"preventative," and the dealer complains that they do not prevent his unfair competitor from taking his business. All very annoying to the party who framed the laws with the best of "intentions."

In the writer's opinion results more satisfactory to both consumer and dealer would obtain if the dealers as a body took the responsibility of cleaning up their own problems, by forming an association having certain rules and obligations on each and every member, and that through publicity by that association, building up a standard to which the consumer would refer and refuse to buy from a dealer who was not a member of such association.

In making use of the information in the following pages, the first thing required is the registered "TRADE NAME" of the coal. Having this name you may check up for the area in which this trade name is located, and by checking again for the information in the particular area the qualification and characteristics of the coal may be obtained. The writer has taken a large part in establishing the "TRADE NAME" as a base of value, on account of the fact of the vast number of mines in some particular area, and that the value of the product to the consumer depends largely upon the manufacturing efforts of the coal producer. Previous to such, the coal was marketed under its area name. This set at a disadvantage those who had spent considerable effort and capital in producing a standard quality product, through others not so well equipped for doing so, offering under the same name, product in poorer condition and having less value.

Trade names have become standard in all lines of business. The wider the distribution of the product the more it is necessary that the producer must take the responsibility of value. The establishment of the trade name has resulted in criticism from various sources, some without foundation and some with justification, but from a consumer's standpoint it is the only method by which he can expect results. In the past the mines have left it largely to the dealer to advertise the value of their product. In making the change this has worked loss to those dealers who have spent money in establishing a coal value under a certain name and for which the dealer will not get all the future value of such name; but from the writer's observations the dealer has never spent much in capitalizing a name for future profits, and has obtained most of the benefit at the time of such advertising.

There are some dealers at points outside of Winnipeg who have bought coals of selected value and have sold these under a name of their own selection. These dealers have built up a clientele on such names and have established a standard of value to them. To these the change in methods sets at a disadvantage, but they

have been sufficiently long in the business to select a coal which has an established value to its name which should equal the standard set by its local name.

The particular harm through local names comes through new dealers starting up with little coal knowledge, selecting a good coal as a starter and marketing it under some name of their own selection and later handling some other coal more profitable to them under the name set for the better coal, to the disadvantage of the consumer and the trade in general. In fact, it was common practice, before it was made law that the trade name must be shown on the delivery tickets, for some of such dealers to buy one car only of an established standard coal and sell all their other product under that name to the disadvantage of the name of the first coal selected.

It has been past policy of the coal producer to leave the responsibility of finding markets for the coal too much to the dealer, wholesale and retail. It must, however, be recognized that marketing coal and producing coal are two different functions, each of which requires its own particular business methods and separate costs of establishing such business. Because a concern is an efficient producer of coal at the mine is not to say that it is equally well equipped to retail coal.

The remark is often pettishly passed by the coal consumer, large and small, that the dealer is unnecessary and that he sees no reason why he should not buy direct from the mines. The writer has pointed out that he (the consumer) expects a large selection of varieties to choose from, and that if all coal was distributed through branch houses set up by the mines, the number of such houses would be infinitely greater than the present number of coal dealers, and the costs would have to be paid for in the price of coal sold. Each mine, large and small, would naturally only have an interest in its own product.

By the present method of independent coal dealers, each dealer acts as agent for a number of mines and holds ten times the variety for selection by the consumer. Such a system as selling direct by the mines would be too much of a gamble in mining. Any company before starting mining operations would of necessity have to finance the opening of branch houses before they would be able to market any product.

The coal dealer is a necessity in the interest of cost and convenience to the consumer. Agreeing that it is such, it is unfair of the consumer to buy direct from the mine, and unfair of the mine to offer it direct to a consumer, unless he has no desire to maintain the goodwill of the dealers as a whole.

The coal producer has, however, shelved some of his responsibility to the dealer, and by so doing harmed the market for his product. The coal dealer's interest is in selling coal for a livelihood. He is not necessarily concerned as to the origin of the coal. He wants to sell a product that will give him the greatest turnover at the least selling effort. In a market such as Winnipeg, where there are so many mining districts, native and foreign, courting the favor of the coal dealer, it creates an over-supply of dealers

and a smaller margin of profit for the dealer. Therefore, the dealer seeks to handle a product which will give him the greatest margin of profit or permit him to stay in business. Further West, district and foreign competition is not so keen, but it would be impossible for a mine or wholesaler to have one price for coal to Winnipeg dealers and one to Western dealers. Yet at the same time the Winnipeg market for Alberta coals is only equal to the price which will stand against foreign competition. On this account the Winnipeg market must be considered more or less as a by-product market. As a concession to this it would be to the producers' interest to take over some of the advertising of their product in Winnipeg and so force more coal through the dealers' hands by the public demand created by the advertising.

The largest item of cost on coal into Winnipeg is transportation cost. This is worthy of investigation by the transportation companies in their own interest. They have to take deliveries at and when the producer or consumer likes, and naturally the cost is set at what the traffic will bear. A get together of the three parties, consumer, producer and railroad, might result in slight readjustments of methods by all three, which in turn would result in a lower selling price of coal, and secure to the Canadian railroads tonnage that does not move to them at the present transportation costs.

In conclusion, do not buy Canadian coal for patriotic reasons only. Patriotism in Canada seems a form of hysteria that requires periodic revival meetings or disaster to keep it alive. Buy Canadian coal because it is good for you as a necessity to keep the business alive in which you gain your living in Canada. The one hundred million of dollars that Canada spends abroad yearly for coal, supports one million population outside of Canada, made up of miners and those producing food, housing, clothing and amusement for them and their families. This is based upon a turnover of the dollar only three times during the year, and giving a sum of \$1,500.00 yearly to the head of a family of five. Can Canada find room for another million population?

G. R. PRATT.

ALBERTA, CANADA

General description of the geology of the Province with the classification of the Coal produced; treats with the mining districts or areas, with a map showing their location and the railroads serving same. Description of the producing seams, kinds of coal, general analyses, coal regulations, etc.

1. Alberta has three main coal measures: the Kootenay; the Belly River or Saunders; and the Edmonton.

2. It is only within the last 25 years that any extensive development has taken place in these areas. From the date of the Province of Alberta's inauguration in 1905 there has been more intensive efforts to develop the coal resources. The recent expansions have been largely in the fields producing Domestic Coals to replace imported anthracite.

3. The Kootenay series are situated along the Rocky Mountain range to the west of the Province, extending from north to south, and contains 41,380,000,000 short tons which are considered available. The coals in this series range from Bituminous to Anthracite in rank.

4. The Belly River series extends over practically the whole of the southern half of the Province, and is mined in the south, east, and west of the Province. The coals range in rank from Sub-bituminous to Lignite. The estimated available quantity in this coal measure is 164,685,000,000 short tons.

5. The Edmonton series overlies the Belly River series in the centre of the lower half of the Province. The rank is Black Lignite, bordering closely to Sub-bituminous in places. The estimated available quantity is 150,239,000,000 short tons.

6. The location of these areas is shown on the accompanying map, with the railroads that serve same.

7. In conjunction with the University of Alberta in Edmonton, a department of the Government has been set up—"The Scientific Industrial and Research Council"—under whose direction field surveys of coal measures are made and correlated; coals tested in the laboratories and under practical operation under boilers, etc.; experiments made to determine methods to be used in burning fuels in the commercial equipment as on the market, and experimental work on carbonizing and briquetting.

8. At the instigation of the Mines Branch in Edmonton, and upon request of the coal operators, rules and regulations governing the marketing of coal have been set up and made law in the Province, effective on April 10th, 1925.

9. In brief the Bill requires that all Alberta coal shall have a registered Trade name, and that Alberta coal shall only be advertised or sold under such Trade name.

10. It further requires that all documents referring to coal shall state the area or district from which the coal comes and the size of the coal. It gives powers of inspection for the purpose of ascertaining whether coal is being sold or shipped under a correct description.

The Bill as passed the Legislative Chamber is as follows:

11.

1925

CHAPTER 21

An Act respecting the Sale of Coal.

(Assented to April 10, 1925.)

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Alberta, enacts as follows:

Short Title

Short Title. 1. This Act may be cited as "The Coal Sales Act, 1925."

Interpretation

Definitions. 2. In this Act, unless the context otherwise requires:

Coal. (a) "Coal" shall include coke;

Manager. (b) "Manager" shall mean the manager certificated under the provisions of The Mines Act, and if there is no such manager, the overman, and where there is no manager or overman, the person having the control and supervision of the mine;

Operator. (c) "Operator" shall mean any person or body corporate who operates a mine and is the immediate proprietor, lessee or occupier thereof, and also any contractor for the working of any mine or part thereof.

Registration of trade name. 3. The operator of every coal mine in Alberta shall register a trade name for the coal mined therefrom in the office of the Chief Inspector of Mines, and all coal shall be both sold and shipped thereunder.

Sale only under trade name. 4. No coal produced in Alberta shall be advertised or sold except under its registered trade name.

Particulars in invoice to be given by manager. 5. Every manager of any coal mine in Alberta shall state in every invoice and shipping bill relating to shipments of coal from such mine, the following particulars:

(a) The name and the post office address of the mine from which the coal was produced and the registered trade name of the coal;

(b) The coal area in which the mine is situated;

(c) The size of the coal shipped.

Particulars in invoice to be given by dealer. 6. Every dealer whether wholesale or retail selling coal produced in Alberta shall state upon every bill, weight-ticket or invoice relating to sales of such coal, the following particulars:

(a) The name and post office address of the mine from which such coal was produced and the registered trade name of the coal;

(b) The coal area in which the mine is situated;

(c) The size of the coal—

and every such dealer selling coal produced elsewhere than in Alberta shall similarly state:

(d) The name of the country, province or state in which it was produced;

(e) The name and the post office address of the mine from which it was produced;

(f) The name of the coal (if any);

(g) The size of the coal.

7. For the purpose of the two preceding sections, the Province is hereby divided into the coal areas set out in schedule A hereto. Coal areas.

8. (1) Every dealer, whether wholesale or retail, selling coal produced in Alberta shall keep a record in his office of: Dealers' Records.

(a) The amount of coal purchased by him from every mine in Alberta or from places outside Alberta;

(b) The amount of the sales of coal so purchased.

(2) Such record shall be classified under the registered trade name of the coal (if any) and shall show the size of the coal and the persons to whom such sales were made.

(3) Such record shall be at all reasonable times open to the inspection of any inspector appointed under the provisions of this Act.

9. An inspector at the point of shipment of any coal shall have power to inspect any invoice or other document relating to coal shipped or about to be shipped, and also to inspect such coal, and if such coal does not conform with the information contained in any such document, or it contains an excess amount of slack or other impurities, he may stamp a statement to that effect upon the face of any such document. Power of inspection at point of shipment.

10. (1) An inspector shall also have power to inspect any invoice or other document relating to the sale of coal whether in the possession of a dealer, either wholesale or retail, or a consumer, and any coal in the possession of any such person, for the purpose of ascertaining whether the coal conforms with the information contained in the invoice, or other document, or whether the coal contains an excess amount of slack or other impurities, or whether the document bears the stamped statement of any inspector. Power of inspection of invoices, etc.

(2) If an inspector finds that any such coal does not conform with the information contained in any such Power to take and retain.

document he may take possession of the said document and retain the same.

Penalty for offences.

11. (1) Any person who fails to make any of the statements upon any document hereinbefore required of him or makes any false statement in any such document, or substitutes any other document for any document upon which any statement has been stamped by an inspector under the provisions of this Act, or otherwise infringes any provisions of this Act, shall be liable upon summary conviction of a fine not exceeding five hundred dollars for each offence or imprisonment for a period not exceeding six months or to both fine and imprisonment.

Offences by Corporations.

(2) Where an offence against this Act is committed by a corporation, the official having the general charge of the business thereof at the place where any act was omitted or committed in contravention of the provisions of this Act, shall be personally liable to the penalties prescribed for any such omission or commission, but nothing in this section shall relieve the corporation or the person who actually committed the offence from liability therefor.

Powers of Lieutenant-Governor in Council.

12. The Lieutenant-Governor in Council may:

(a) Add to or subtract from the number of coal areas into which the Province is divided by this Act;

(b) Appoint inspectors for the purposes of this Act.

(c) Classify and grade coal;

(d) Prescribe fees for any services or work performed under the provisions of this Act;

(e) Make such regulations as may be necessary or convenient to ensure the sale and shipment of coal in accordance with this Act.

Coming into force of Act.

13. This Act shall come into force on the day upon which it is assented to.

12.

COAL AREAS OF ALBERTA—See Map

1. Ardley	16. Empress	31. Pembina
2. Big Valley	17. Gleichen	32. Pincher
3. Brooks	18. Halcourt	33. Prairie Creek
4. Brule	19. Highwood	34. Redcliffe
5. Camrose	20. Lethbridge	35. Rochester
6. Carbon	21. Magrath	36. Saunders
7. Cascade	22. Milk River	37. Sexsmith
8. Castor	23. Morley	38. Sheerness
9. Champion	24. Mountain Park	39. Smoky River
10. Clearwater	25. Nordegg	40. Steveville
11. Clover Bar	26. Old Man.	41. Taber
12. Coalspur	27. Pakan	42. Tofield
13. Crow's Nest	28. Pakowki	43. Wainwright
14. Drumheller	29. Panther	44. Wetaskiwin
15. Edmonton	30. Pekisko	45. Whitecourt

(Note: For the purpose of identification with the map the areas have been numbered.)

13. The need for regulations as outlined was in order to protect the ultimate coal buyer, and the coal producer whose effort was to produce a quality coal against new developments which had not the necessary equipment to produce quality coal.

Several cities in Western Canada have put into force similar regulations for persons dealing in coal within their district.

14. The Province of Alberta has been divided into 45 coal areas. In making the division the effort of the Government was to make the sub-division by coal characteristic rather than geography, so that the rank of the coal should be very similar from any part of that area. This cannot, however, be accepted as a standard rule, as it is found that there are places where there is a considerable difference in the coals adjacent to each other in the same seam, particularly in the direction of east and west.

The coal mining areas of the Kootenay coal measure are:

15. Crow's Nest Area—No. 13.

The mines in this area produce Steam and Railroad coal, also a small amount of lump coal for threshing machines. In rank they are Bituminous. The seams are intensely folded and faulted, due to their location in the mountains. The workable seams range in thickness from 2 feet to 20 feet. One of the mines is equipped with air washing plant and others are following suit. One of the mines producing good Domestic Coke.

Railroad—C. P. R.

The production from this field:

1920	1,775,481 short tons
1921	1,282,571 " "
1922	1,025,771 " "
1923	1,602,292 " "
1924 (reduction through strike).....	884,759 " "
1925	1,132,300 " "

Representative analysis:

Moisture	2.5
Volatile matter	24.9
Fixed carbon	61.1
Ash	11.5
Sulphur	0.6
B. T. U.	13,140
Good coke.	

16. Old Man Area—No. 26.

There are no producing mines operating in this area. Tests of prospects show the coals to be similar to area No. 13.

17. Highwood Area—No. 19.

Little has been done except survey and prospect this area. Development awaits railroad transportation. The rank of the coal as shown by field samples is Semi-bituminous.

Field analyses show:

Moisture	0.3
Volatile matter	15.1
Fixed carbon	75.7
Ash	8.7
Sulphur	0.5
B. T. U.	14,150

18. Cascade Area—No. 7.

The mines in this area produce Steam, Railroad and Semi-anthracite for domestic heating. In rank they range from Semi-anthracite to Anthracite.

The seams are folded and faulted, and the coal is in its natural condition very friable. For a number of years the Canadian Pacific Railway Company operated on the Anthracite seam at Bankhead. This has recently been discontinued due to the large amount of smalls; until they closed down the smalls had been briquetted.

The Semi-anthracite mined at Canmore also has high percentage of smalls, for which is now installed a briquetting plant.

The thickness of seams are not greater than 8 feet.

Railroad—C. P. R.

The production in this area:

1920	403,026 short tons
1921	303,215 " "
1922	210,224 " "
1923	264,555 " "
1924 (strike period)	121,139 " "

Representative analysis:

	Semi-anthracite	Anthracite
Moisture	0.8	0.6
Volatile matter	16.3	8.8
Fixed carbon	72.3	77.0
Ash	10.6	13.6
Sulphur	1.0	0.5
B. T. U.	13,500	12,890

Non-coking, slow burning.

Briquettes are now being produced from Canmore slack and an asphalt binder.

In the writer's opinion the burning characteristics of these briquettes are more favorable than any briquette on the market.

The volatile is driven out slowly in burning and does not tend to make the smoky flame that usually applies with a briquette.

Although Canmore coal is not considered caking under ordinary conditions the characteristic of the binder combined with the char-

acteristic of the coal forms a very strong briquette which maintains its shape without breakage in burning.

Analyses Canmore Briquettes:

Moisture	3.0
Volatile matter	18.8
Fixed carbon	69.9
Ash	8.3
B. T. U.	14,160

19. Panther Area—No. 27.

20. Clearwater Area—No. 10.

There are no producing mines in these areas, and not sufficient records on hand to classify the coal values.

21. Nordegg Area—No. 25.

Producing Bituminous coal for railroad and steam purposes. There are two workable seams in this area, Nos. 2 and 3, No. 2 being 6 to 7 feet and No. 3, 14 to 15 feet in thickness.

See annual report of Alberta Scientific and Research Council for 1922 for the geology of the basin.

Production in this area:

1920	411,620 short tons
1921	441,206 " "
1922	396,706 " "
1923	493,930 " "
1924 (strike period)	171,296 " "

Representative analysis:

Moisture	0.7
Volatile matter	16.4
Fixed carbon	71.5
Ash	11.4
Sulphur	0.3
B. T. U.	13,500

Poor coke, free burning.

Railroad—C. N. R.

22. Mountain Park Area—No. 24.

Producing Bituminous coal for railroad and steam purposes. There are four workable seams in this area:

Seam No. 1 being from 12 to 52 feet in thickness.

Seam No. 2 being from 10 to 49 feet in thickness.

Seam No. 3 being from 12 to 36 feet in thickness.

Seam No. 4 being from 5 to 28 feet in thickness.

Production:

1920	241,368 short tons		
1921	354,777	"	"
1922	355,653	"	"
1923	634,474	"	"
1924 (strike period)	283,500	"	"

Representative analysis:

Moisture	.96
Volatile matter	27.35
Fixed carbon	59.66
Ash	12.03
Sulphur	.36
B. T. U.	13,320
Fair coke.	

Railroad—C. N. R.

23.—Brule Area—No. 4.

This district produces railroad coal. The seams are very much faulted and the coal has considerable amount of smalls. The rank of the coal is Semi-bituminous.

Production in this field has been:

1920	236,008 short tons
1921	250,618 " "
1922	338,256 " "
1923	248,659 " "
1924 (temporarily closed; develop- ment work)	523 " "

Representative analysis:

Moisture	0.5
Volatile matter	18.6
Fixed carbon	67.4
Ash	13.5
Sulphur	0.5
B. T. U.	13,450

Good coke.

Railroad—C. N. R.

24. Smoky River Area—No. 39.

No coal production has taken place in this area. The area has recently been surveyed by the Dominion Fuel Board of Canada in co-operation with the Department of Mines, Ottawa. See Dominion Fuel Board publication No. 7, Geological Survey No. 2055.

The rank of the coal is Semi-bituminous. The indications are that there are seven workable seams, having a total thickness of 62 feet, of which it is probable that 1,172,730,000 tons can be extracted.

An average analysis of six field samples taken from various seams is as follows:

Moisture	1.9
Volatile matter	13.8
Fixed carbon	72.3
Ash	7.0
Sulphur	0.4
B. T. U.	13,900

Little development will take place in this area until the Peace River district becomes more populated, so that it will support more railroads.

The Belly River coal measure is being worked in the following areas:

25. Saunders Area—No. 36.

The mines in this area produce coal for domestic purposes. In rank they are Sub-bituminous. The seams are folded and faulted and coal is fairly friable, due to the strains undergone.

There are two workable seams, ranging in thickness from 5 feet to 11 feet.

The area has been surveyed and findings published in the fourth annual report of the Scientific Industrial Research Council of Alberta.

Production from this area:

1920	42,155 short tons
1921	38,053 " "
1922	74,434 " "
1923	73,295 " "
1924	68,546 " "

Representative analysis:

Moisture	8.5
Volatile matter	34.5
Fixed carbon	49.4
Ash	7.6
Sulphur	0.3
B. T. U.	11,560

Non-coking.

A peculiar feature of this coal is that in burning it opens up in the fire like tulips developing from buds. Ignition of the volatile from this coal is very fast and the coal is free burning. The ash has a reddish tinge.

Railroad—C. N. R.

26. Coal Spur Area—No. 12.

Mines in this area produce coal for domestic purposes and stripped coal for railroad purposes. In the mined coal the seams are folded and faulted. The coal produced is blocky and strong.

There are at present two seams being mined, ranging in thickness from 5 feet to 12 feet. Rank—Sub-bituminous.

Production of coal from these seams has been:

1920	151,751 short tons
1921	121,406 " "
1922	153,849 " "
1923	88,337 " "
1924 (estimated)	124,000 " "

Representative analysis:

Moisture	7.38
Volatile matter	35.13
Fixed carbon	47.14
Ash	10.35
Sulphur	0.3
B. T. U.	11,100
Non-coking.	

The volatile ignition is fairly fast and coal is free burning.

27. In addition to the coal which is mined there are mounds of coal which are operated as stripping pits. These mounds have seams of coal from 60 to 100 feet in thickness. The coal is more or less broken, and although the indications point to it being of the same maturity as the mined coal it is more slabby in structure, differing from the mined coal, which is blocky. The volatile ignites fairly fast, but the coal is not so free-burning as the mined coal. Due to the structure, as mined it is higher in ash.

The production has been:

1920	244,633 short tons
1921	171,104 " "
1922	406,363 " "
1923	288,266 " "
1924 (estimated)	382,050 " "

This coal is used principally for railroad purposes. On account of its sparking feature there are certain seasons during the year when it is not considered safe to use it for locomotive purposes.

Representative analysis:

Moisture	7.4
Volatile matter	33.0
Fixed carbon	45.6
Ash	14.0
Sulphur	0.3
B. T. U.	10,400
Non-coking.	

Railroad—C. N. R.

28. Lethbridge Area—No. 20.

Mines in this district produce coal for domestic purposes. The seam is faulted, but not folded. One seam is being worked, this ranges in thickness from 4 feet to 4½ feet. The coal is Black Lignite bordering on Sub-bituminous, classified by the Province of Alberta as domestic coal on account of its characteristics in the domestic furnace. See note on Alberta Domestic Coals. Structure slabby, strong, and stands up well in handling; mined with large percentage of big lump.

Production from this area in:

1920	850,662 short tons
1921	776,667 " "
1922	565,926 " "
1923	654,215 " "
1924	406,585 " "

Representative analysis:

Moisture	9.73
Volatile matter	37.16
Fixed carbon	43.56
Ash	9.55
Sulphur	0.6
B. T. U.	11,000
Non-coking.	

Railroad—C. P. R.

The coal is quick igniting, and free burning.

29. Taber Area—No. 41.

Coal in this area is similar in characteristics to the Lethbridge, but not of such high rank, the representative analysis being:

Moisture	14.8
Volatile matter	31.8
Fixed carbon	42.9
Ash	10.5
Sulphur	1.0
B. T. U.	10,000
Non-coking.	

Productions:

1920	133,627 short tons
1921	42,203 " "
1922	63,867 " "
1923	27,772 " "
1924	90,644 " "

Railroad—C. P. R.

30. Redcliffe Area—No. 34.

Mines in this district produce coal for domestic purposes.

The chemical classification of this coal is Black Lignite. Alberta classification, "Domestic."

Production from this area:

1920	8,000 short tons
1921	16,747 " "
1922	34,076 " "
1923	23,163 " "
1924	50,203 " "

Representative analysis:

Moisture	24.48
Volatile matter	30.24
Fixed carbon	37.93
Ash	7.35
Sulphur	0.5
B. T. U.	8,630

The coal is slabby in structure, free volatile ignition and free burning.

Railroad—C. P. R.

31. Coal for Threshing

Screened coal from—Crow's Nest area, Cascade, Mountain Park, Nordegg, Saunders, Coalspur and Lethbridge, make excellent fuel for threshing machines.

32. Blacksmiths' Coal

Crow's Nest area produces good blacksmith coal.

In the following areas there is a very small amount of coal produced. The coals are apparently similar to the other domestic producing areas in characteristics, but in varying conditions as to maturity and chemical analysis:

34. Coal Production

	1920	1921	1922	1923	1924
3. Brooks	13,856	14,781	15,610	8,316	8,088 (C.P.R.)
16. Empress	No reliable data, local use only.				
18. Halcourt	No reliable data, local use only.				
21. Magrath	1,827	2,539	3,137	2,863	2,514 (C.P.R.)
22. Milk River	6,230	6,544	9,206	6,031	7,261 (C.P.R.)
23. Morley	No reliable data, local use only.				
27. Pakan	No reliable data, local use only.				
28. Pakonki	No reliable data, local use only.				
30. Pekisko	No reliable data, local use only.				
32. Pincher	5,575	8,100	10,850	9,444	12,680 (C.P.R.)
33. Prairie Creek.	No reliable data, local use only.				
35. Rochester	No reliable data, local use only.				
37. Sexsmith	No reliable data, local use only.				
40. Steveston	No reliable data, local use only.				
43. Wainwright ..	No reliable data, local use only.				

General Analysis

As taken at the Mine
From Report No. 14, Scientific and Industrial Research Council
of Alberta

BELLY RIVER HORIZON

No.	Area	Moisture	Volatile	Carbon	Ash	Sulphur	B.T.U.
3.	Brooks .....T	17.6	31.5	39.9	11.0	0.7	9,330
	" Maximum	18.3	32.1	42.2	14.2	....	9,680
	" Minimum	17.0	30.7	37.9	8.1	....	8,980
16.	Empress	No reliable data					
18.	Halcourt .....T	13.6	31.7	44.5	10.2	....	10,700
	" Maximum	14.2	33.3	46.4	13.6	....	11,220
	" Minimum	12.9	30.3	42.4	7.4	....	10,110
21.	Magrath .....T	7.1	35.5	45.7	11.7	....	11,570
	" Maximum	7.6	38.1	47.2	18.3	....	12,250
	" Minimum	6.6	32.2	41.9	7.8	....	10,570
22.	Milk River—						
	A District .....T	13.4	30.7	43.2	12.7	....	10,000
	" Maximum	13.6	30.8	44.2	13.1	....	10,150
	" Minimum	13.2	30.6	42.7	12.0	....	9,850
	B District .....T	20.1	29.4	41.3	9.2	....	9,260
	" Maximum	21.1	29.9	42.3	9.5	....	9,430
	" Minimum	19.3	29.1	40.3	9.0	....	9,050
23.	Morley	No reliable data					
27.	Pakan	No reliable data					
28.	Pakoki—						
	A District .....T	24.6	30.1	38.6	6.7	0.8	8,630
	" Maximum	25.2	30.3	38.7	7.4	....	8,650
	" Minimum	24.1	29.8	38.5	6.0	....	8,610
	E District .....T	37.5	27.8	25.3	9.4	1.1	6,060
30.	Pekisko—						
	A District .....T	7.7	35.9	46.9	9.5	0.8	11,980
	" Maximum	8.9	36.5	48.5	11.9	....	12,350
	" Average	7.0	35.2	44.6	7.7	....	11,450
	B District .....T	4.0	21.9	61.5	12.6	0.6	12,770
32.	Pincher .....T	6.9	33.6	43.0	16.5	0.9	11,190
	" Maximum	7.5	35.2	45.3	19.0	....	11,880
	" Minimum	6.4	31.7	40.7	13.2	....	10,740
33.	Prairie Creek	No reliable data					
35.	Rochester	No reliable data					
37.	Sexsmith .....T	29.6	27.8	36.5	6.1	0.5	8,130
40.	Stevenville	No reliable data					
43.	Wainwright	No reliable data					

T—Typical analysis.

36. The Edmonton coal measures have been sub-divided into the following areas. The coals are produced for domestic use. In general the volatiles from these coals burn with a cleaner flame than coals from the Belly River series, notwithstanding any similarity of the analysis.

37. Drumheller Area—No. 14.

This area at the present time is the largest producer of the coals of the Edmonton coal measure.

There are eleven seams, four of which are workable, being numbers 1, 2, 5 and 7. Trade and custom have established two differ-

ent classes for these coals—upper seams 5 and 7 and lower seams 1 and 2. In appearance the upper seam is more glossy than the lower. Both classes are blocky and are mined in big lumps. The lower seams being slightly stronger than the upper. In the fire the coals differ slightly in characteristics, the volatile from the upper seams ignite much quicker and the coal is more free burning, which requires closer regulation of the drafts.

There are 17 mines in this area, each producing over twenty thousand tons per annum.

The production from the area, both upper and lower seam coals, has been:

1920	1,210,687 short tons
1921	992,456 " "
1922	1,170,936 " "
1923	1,237,368 " "
1924	1,109,227 " "

Representative analysis:

	Upper Seam	Lower Seam
Moisture	17.44	16.73
Volatile matter	31.92	31.54
Fixed carbon	43.89	44.77
Ash	6.75	6.96
Sulphur	0.4	0.4
B. T. U.	9,830	9,930

Non-coking.

Rank—Black Lignite. Alberta Classification—Domestic.

The railroads into this area are the C.P.R. and the C.N.R.

For the geology of the district, see third annual report of Scientific and Industrial Research Council of Alberta No. 4, 1921.

38. The Clover Bar Area—No. 11.

There are two seams being worked in this area. The coal is glossy in appearance, clean, and produced in large blocks. In the fire they are fast igniting and free burning.

The production:

1920	343,396 short tons
1921	363,077 " "
1922	435,284 " "
1923	395,371 " "
1924	400,874 " "

Representative analysis:

Moisture	23.56
Volatile matter	30.92
Fixed carbon	39.36
Ash	6.16
Sulphur	0.3
B. T. U.	9,050

Non-coking.

Rank—Black Lignite. Alberta Classification—Domestic.

The railroads into this area are the C.P.R. and the C.N.R.

39. Edmonton Area—No. 15.

Coals are produced in this area having two different characteristics. For that produced in and around the City of Edmonton the same remarks as to characteristics and analysis can be applied as to Clover Bar. That produced around Cardiff has similar chemical analysis to that of Clover Bar, but is slabby in structure and slower igniting. The slabby feature also makes it slower burning.

Production:

1920	287,042 short tons
1921	230,746 " "
1922	229,144 " "
1923	221,876 " "
1924	235,496 " "

The railroads into this area are the C.P.R. and the C.N.R.

40. Pembina Area—No. 31.

There are two seams being worked—Pembina seam, 7 ft. in thickness, and the Wabamun seam, which is 26 ft. thick; 7 ft. of this seam is being worked.

This coal is slabby and dull black in appearance. As compared with some of the other domestic coals it is slower igniting and slower burning.

Production:

1920	176,561 short tons
1921	163,565 " "
1922	153,241 " "
1923	168,139 " "
1924	197,292 " "

Representative analysis:

Moisture	17.97
Volatile matter	30.62
Fixed carbon	42.10
Ash	9.31
Sulphur	0.2
B. T. U.	9,370

Non-coking.

Railroad—C. N. R.

41. Carbon Area—No. 6.

In the lower half of this area the producing mines are working on seams No. 11 and 12. This coal is blocky in structure, but slightly more friable than the upper seams worked in Nos. 5 and 7 seams of the Drumheller area.

Produced for domestic purposes.

The railroads into this area are the C.P.R. and the C.N.R.

Representative analysis:

Moisture	15.58
Volatile matter	32.42
Fixed carbon	41.50
Ash	10.50
Sulphur	0.5
B. T. U.	9,800

Non-coking.

The volatile is ignited freely and coal is free burning.

42. In the upper half of the area around Threehills coal is produced similar in appearance and analysis, but is much slower in volatile ignition and in its free burning qualities.

Production:

1920	40,891 short tons
1921	44,354 " "
1922	84,367 " "
1923	91,605 " "
1924	177,714 " "

43. Tofield Area—No. 42.

One seam is worked in this area; seam is very close to the surface and is worked as a stripping operation. Coal is blocky, bright in appearance; mined for domestic purposes. Rank—Black Lignite. Fast ignition and free burning.

Production:

1920	53,226 short tons
1921	50,469 " "
1922	86,909 " "
1923	104,886 " "
1924	110,551 " "

Representative analysis:

Moisture	26.3
Volatile matter	30.4
Fixed carbon	38.3
Ash	5.0
Sulphur	0.5
B. T. U.	8,580

Non-coking.

Railroad—C. N. R.

44. Camrose Area—No. 5.

Coal is blocky, bright in appearance; mined for domestic purposes. Rank—Black Lignite. Fast ignition and free burning. Alberta Classification—Domestic.

The railroads into this area are the C.P.R. and the C.N.R.

Production:

1920	72,567 short tons
1921	68,621 " "
1922	76,038 " "
1923	72,656 " "
1924	90,905 " "

Representative analysis:

Moisture	25.4
Volatile matter	29.9
Fixed carbon	39.1
Ash	5.6
Sulphur	0.5
B. T. U.	8,770

Non-coking.

45. Big Valley Area—No. 2.

Coal is slabby and dull black in appearance. Mined for domestic purposes. Rank—Black Lignite. Alberta Classification—Domestic.

Production:

1920	52,349 short tons
1921	57,479 " "
1922	37,215 " "
1923	47,795 " "
1924	55,654 " "

Representative analysis:

Moisture	19.9
Volatile matter	28.8
Fixed carbon	40.8
Ash	10.5
Sulphur	0.5
B. T. U.	8,750
Non-coking.	

Railroad—C.N.R.

The coal is slow igniting, and although it has free burning qualities it requires high draft to maintain fire in operation.

46. Sheerness Area—No. 38.

Coal is slabby and dull black in appearance; mined for domestic purposes. The coal is slow igniting, and although having free burning qualities it requires high draft to maintain fire.

Rank—Black Lignite.

Production:

1920	29,643 short tons
1921	33,099 " "
1922	42,573 " "
1923	29,563 " "
1924	42,438 " "

Representative analysis:

Moisture	24.1
Volatile matter	29.7
Fixed carbon	40.6
Ash	5.6
Sulphur	0.4
B. T. U.	8,730
Non-coking.	

Railroad—C. N. R.

47. Ardley Area—No. 1.

Coal is slabby and dull. Produced for domestic purposes, mined and also by stripping operations. Coal is slow igniting, free burning, but requires high draft to maintain fire. There is considerable difference in the qualifications of the mined and stripped coal.

Rank—Black Lignite. Alberta Classification—Domestic.

Production:

1920	20,218 short tons
1921	20,346 " "
1922	21,305 " "
1923	15,490 " "
1924	16,720 " "

Representative analysis:

Moisture	17.3
Volatile matter	27.5
Fixed carbon	44.3
Ash	10.9
Sulphur	0.5
B. T. U.	9,330

Non-coking.

The railroads into this area are the C.P.R. and the C.N.R.

48.

General Analysis

As taken at the Mine

From Report No. 14, Scientific and Industrial Research Council
of Alberta

EDMONTON HORIZON

No.	Area	Moisture	Volatile	Carbon	Ash	Sulphur	B.T.U.
8.	Castor—						
	A District .....T	24.4	30.2	39.5	5.9	0.3	8,840
	“ Maximum	25.7	30.6	41.5	8.6	....	9,110
	“ Minimum	23.4	29.8	37.1	3.8	....	8,630
	C District .....T	28.8	28.8	35.0	7.4	0.5	7,740
	“ Maximum	29.7	29.7	35.4	9.5	....	7,870
	“ Minimum	27.4	28.0	34.7	5.6	....	7,650
17.	Gleichen .....T	16.8	29.6	37.2	16.4	0.3	8,580
	“ Maximum	17.4	32.7	41.7	26.5	....	9,540
	“ Minimum	15.5	25.1	31.1	9.9	....	7,090
9.	Champion .....T	13.4	34.4	44.7	7.5	1.1	10,430
	“ Maximum	15.5	36.0	48.5	11.6	....	10,760
	“ Minimum	12.1	32.1	41.1	5.1	....	9,950

44. Wetaskiwin No reliable data

45. Whitecourt No reliable data

T—Typical analysis.

All producing mines in Alberta are served by either of the two railroads, except where noted for both roads—the Canadian Pacific Railway (C. P. R.) and the Canadian National Railway (C. N. R.).

49. A revision of some of the districts took place in making up the Coal Sales Act of April, 1925.

Alderside is now included in Champion area.

Banff District included in Cascade area.

Battle River District included in Castor area.

Bow Island District included in Taber area.

Brazeau District changed to Nordegg area.

Calgary included in Morley area.
Canmore District included in Cascade area.
Cardiff District partly in Edmonton and Rochester areas.
Hanna District included in Sheerness area.
High River District included in Pekisko area.
Jasper Park District included in Brule area.
Lacombe District included in Castor area.
Medicine Hat District included in Redcliffe area.
Namao District included in Edmonton area.
Peace River District included in Halcourt and Sexsmith area.
Rosedale District included in Drumheller area.
Strathcona District included in Edmonton area.
Three Hills District included in Carbon area.
Trochu District included in Ardley area.
Wabamun District included in Pembina area.
Wayne District included in Drumheller area.
Yellowhead District included in Coalspur area.

50. Both the Belly River series and the Edmonton series produce coal primarily for domestic purposes. The trade sizes produced are:

Run of mine,
Double screened lump,
Single screened lump,
Furnace lump,
Stove,
Nut,
Nut Pea,
Slack.

No standard of sizes have been set up which will apply to all areas. Each area produces a standard according to the characteristics of the coal in that area. No standards have yet been put into force which must be conformed to. Each mine producing sets his own standard. Work is being done by the Alberta Government Scientific Industrial and Research Council in an effort to determine standards which may be applied to the various areas.

Note: At the annual convention of the Western Canada Coal Association a resolution was passed petitioning for one standard only of lump coal to be all over a $2\frac{1}{2}$ inch perforated screen, and one standard of stove, 1 inch to $2\frac{1}{2}$ inch. This was approved by a representation of 70% of the Drumheller coal producers.

Run of mine from the domestic fields is usually all coal as mined except the dust which is screened out. A comparatively small proportion of this size is shipped. Most shipments of coal in this condition is screened by the dealer into various sizes suitable for his business. Run of mine is not a good size for the coal consumer on account of the trouble in firing it, through lack of knowledge as to how it should be fired.

Double screened lump is usually considered to be all lump over 6 inches. Each mine, however, sets his own minimum size. There is no limit to the size which the lumps may go to. Efforts are made to have them no larger than will pass through the consumer's coal chute.

Single screened lump. This size usually includes all coal stove size and larger. It is the opinion of fuel experts that this size is a better fuel for the consumer than double screened.

Furnace lump usually consists of all coal screened out when making double screened lump, except nut size and smaller.

Stove is usually considered to be $1\frac{1}{2}$ by 3 inch, but numbers of mines include sizes up to 4 inches.

Nut is usually considered to be $\frac{3}{4}$ inch to $1\frac{1}{2}$ inch.

Nut pea is 1 inch to $\frac{1}{2}$ inch.

Slack, all below $\frac{1}{2}$ inch.

Not all mines produce all the sizes; each mine usually produces the number of sizes in accord with the structural strength of his coal.

Double screened lump and single screened lump is suitable for all types of the standard domestic heating equipment, large and small heaters, hot air furnaces, hot water and steam boilers, and for heating plants in blocks and offices.

Furnace lump is most suitable for large sizes of the above heating equipment.

Stove size for the larger domestic heating equipment and for domestic cooking in ranges.

Nut—for domestic heating equipment where special arch is installed in firepot; and for self feed boilers similar to the Spencer.

Nut pea—same as above, and for automatic stokers for power and heating.

Slack—For automatic stokers for power and heating.

It is believed by the writer that through the medium of educational work by the authorities and coal producers, and from experience of the coal purchaser, that there will be a gradual use of coal containing the small as well as lump for domestic purposes. The small has practically the same heat value as the lump but requires slightly more intelligence in firing it.

51. Regarding the classification of "domestic" coal given by the Alberta Government to the coals produced for domestic purposes.

It had been long established by custom to call anthracite "hard" coal and all others "soft" coal. Around the districts adjacent to the mines producing the "domestic" coals the users had grown up to the means of firing them. During the coal shortage in 1919 it was necessary to put coal from Alberta into a market that had been using entirely anthracite. Neither dealers nor coal users were educated to the difference between the "domestic" grades and the bituminous coals. Therefore, in buying it as soft coal, reference as to values was taken from their chemical analysis and the B. T. U. values given. Like all coals offered where size and preparation has a service value, the value of the work of preparing them did not show up in the B. T. U. rating. Consequently when comparison was made of one soft coal with another upon price and B. T. U., the best value was apparently with the Bituminous coal in unprepared sizes of run of mine.

Those who were unfortunate in making their selections of "soft" coal were fully satisfied that soft coal was a very unsuitable fuel for their purpose. Those who had on occasions made better guesses intermittently during the season decided that certain kinds of soft coal were suitable, but that on the whole "soft" coal was not a desirable coal on account of the uncertainty of the product.

In order to segregate the two classes and to protect the coal purchaser, the coals particularly adaptable for domestic purposes were designated "domestic" coals.

Description of the burning characteristics of the Alberta "domestic" coals.

There is considerable difference in the action in the fire of coals from the various areas. The chemical analysis of one may be the same as another, but from one the volatile may ignite very quickly and be the opposite from the other in effect. One may require the ash pit sealed tight to control the high rate of burning while another may require it wide open to maintain heat.

Practically all below 10,000 B.T.U. value have very little color to the smoke before ignition. Some from the Belly River measure make a small amount of soot if the flame is chilled too quickly, and some of the Edmonton series are sootless under all conditions.

52. The term free burning is used to designate the characteristics of the mass of carbon or coke after the volatile has been dissipated. Once the fuel has become red hot it remains in that condition until burned to an ash. Shutting off all draft will not smother it, but will delay its final dissipation from a few hours to days. When in this dormant condition it can be brought up to an intense fire in a few minutes by shaking the grates and putting on the draft.

53. The following table is compiled from "observation only" of the action of the various fuels in the ordinary standard domestic heating equipment, their strength and storage possibilities, etc.:

	No.	Anthracite		Gas Coal		Upper Drumheller		Lower Drumheller		Coal Spur	Carbon Three Hills	Carbon	Pembina	Lethbridge					Redcliffe	Saunders	Edmonton Clover Bar	Taber	Camrose	Ardley
Resistance to breakage	1					100	110	120	90	90	95	95	125	100	95	98	112	95	130					
Draft required	2	180			130	100	102	105	107	104	109	109	109	100	95	98	106	90	115					
Thickness of ash on grates	3					3"	3"	2"	2"	2"	1½"	2"	2"	1½"	1"	3½"	2"	3½"	2"					
Kind of flame	4				YS	T	Y	Y	T	Y	T	Y	Y	Y	Y	T	Y	T	T					
Speed of Ignition	5				110	100	102	105	90	102	87	87	108	103	110	105	103	100	85					
Free burning qualities of carbon	6	25			40	100	97	90	85	95	95	95	97	98	90	108	102	110	80					
Smoke	7				B	TW	W	Y	L	W	L	L	Y	Y	Y	L	Y	L	W					
Storage in open	8					No	No	No	No	No	No	No	No	No	No	No	No	No	No					
Storage, open shed	9					No	No	Yes	No	No	No	No	F	No	F	No	F	No	F					
Storage, closed shed	10					Yes	Yes	Yes	Yes	Yes	F	F	Yes	F	Yes	F	Yes	F	Yes					
Storage, cellar	11					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					

Note: V = Volatile; S = Semi-volatile; A = Anthracite.

Note: Y—Yellow; S—Sooty; T—Transparent; B—Black; W—White; L—Little.

54. It being found necessary to educate both dealer and user in the methods to be used in firing the coals, unless waste and loss of service occurred, the Government of the Province of Alberta, through its Coal Truth Office, undertook to run a series of experiments on finding means of adapting the method of firing the coal to suit the prevailing equipment, and also to take the necessary means of bringing the methods to be adopted before the public through demonstration stations and by special publications.

The method adopted has been very successful. In brief, it consists of maintaining one side of the fire at a higher rate of combustion than the other until all the volatile has been burned off; control of rate of burning by draft damper and thickness of ash bed. This permits of the combustion of all the volatiles as driven out. The method adopted is not new, but is particularly favored by the low ignition temperature of the volatiles and the free burning qualities of the carbon, which makes the operation automatic except for the intervals wide apart when fresh coal must be put on, from once to four times in the 24 hours according to climatic conditions.

55. The following are the principal shipping mines of Alberta, showing the registered Trade Name of the coal, the owner and Post Office address, with the area in which the mine is situated. Inspection of the description of coal given for the area will indicate the class of the coal which the particular mine can offer for sale.

Note—See 58 for complete list of registered mines.

Registered Name of Coal	Owner	Address	Area
Ajax Coal	Ajax Coal Mining Co.	Med. Hat	Redcliffe
Ardley Hardite	Mutual Coal Mines of Canada	Ardley	Ardley
Atlas Coal	Atlas Coal Co.	Drumheller	Drumheller
Acorn Coal	Acorn Coal Co.	Saunders	Saunders
Alexo Coal	Alex Coal Co.	Saunders	Saunders
Bellevue Coal	West. Can. Colls. Ltd.	Bellevue	Crow's Nest
Big Valley Coal	Big Valley Colls. Ltd.	Big Valley	Big Valley
Brazeau Bituminous Steam	Brazeau Colls. Ltd.	Nordegg	Nordegg
Big Horn	Big Horn and Saunders Creek	Saunders	Saunders
Bush Coal	Bush Mine Coal Co. Limited	Edmonton	Clover Bar
Black Diamond	Great West Coal Co.	Edmonton	Clover Bar
Black Gem	Fraser-McKay Colls. Limited	Edmonton	Clover Bar
Blue Diamond	Blue Diamond Coal Co.	Brule	Brule
Chinook Coal	Chinook Coal Co. (Closed down)	Lethbridge	Lethbridge
Canmore Smokeless	Canmore Coal Co. Ltd.	Canmore	Cascade
Canadian Dinant	Can. Dinant Coal Co. Limited	Dinant	Camrose
Champion Coal	J. D. Thomas	Nacmine	Drumheller
Craig's Coal	Craig's Coal Co. Ltd.	Drumheller	Drumheller
Carbonite Coal	Great West Coal Co. Limited	Aerial	Drumheller
Commercial Coal	Western Commercial Coal Co.	Wayne	Drumheller
Capital Coal	Capital Colls. Limited	Wayne	Drumheller
Ed. Chinook	Edmonton Colls. Limited	Edmonton	Edmonton
Cova Coal	Coal Valley Mining Co. Limited	Edmonton	Coalspur (Strip)
Cadomin Coal	Cadomin Coal Co. Limited	Edmonton	Mt. Park
Dobell Coal	Dobell Coal Co. Limited	Tofield	Tofield
Dominion Block	Red Cliff Brick & Coal Co. Ltd.	Redcliffe	Redcliffe
Ellis Coal	Ellis Coal Co. Limited	Three Hills	Carbon
Elgin Coal	Elgin Coal Co. Limited	Drumheller	Drumheller
Excelsior	Excelsior Colls. Limited	Wayne	Drumheller
Federal Coal	C. S. Donaldson Coal Co.	Lethbridge	Lethbridge
Foothills Coal	Foothills Colls.	Winnipeg	Coalspur
Greenhill Coal	West. Can. Colls. Limited	Bellevue	Crow's Nest
Galt Coal	C.P.R. Dept. Natural Resources	Lethbridge	Lethbridge
Hillcrest Coal	Hillcrest Colls. Limited	Hillcrest	Crow's Nest
Head Light	Tofield Coal Co. Limited	Tofield	Tofield
Hy-Grade	Hy-Grade Coal Co. Limited	Drumheller	Drumheller
Humberstone	Humberstone Mines Limited	Edmonton	Clover Bar
International	International Coal & Coke Co.	Coleman	Crow's Nest
Jewell Coal	Jewell Colls.	Wayne	Drumheller
King Coal	Canadian Coal Co. Limited	Cardiff	Edmonton
Imperial Coal	North American Colls. Limited	Coalhurst	Lethbridge
Lethco Coal	Lethbridge Coal Co. Limited	Lethbridge	Lethbridge

Registered Name of Coal	Owner	Address	Area
Diamond Coal	Consolidated Diamond Colls. Ltd.	Lethbridge	Lethbridge
Luscar Coal	Luscar Coll. Limited	Edmonton	Mt. Park
Mohawk Coal	Mohawk Bituminous Mines Ltd.	Bellevue	Crow's Nest
Majestic Coal	Majestic Coal Co.	Taber	Taber
Midland Coal	Midland Colls. Ltd.	Midland- ville	Drumheller
Maple Leaf	B. T. Brooks	Drumheller	Drumheller
Mid-West Coal	Mid-west Colls. Limited	Drumheller	Drumheller
Marcus Coal	Marcus Coal Mines Limited	Edmonton	Clover Bar
Mine Head Coal	Balkan Coal Co.	Balkan	Coalspur
Mountain Park	Mountain Park Colls. Limited	Edmonton	Mt. Park
McGillivray Creek Coal	McGillivray Creek Coal & Coke Limited	Coleman	Crow's Nest
McLeod River Coal.	Saunders Ridge Coal Co. Ltd.	Coalspur	Coalspur
North Star	North Star Coal Co.	Alix	Ardley
Newcastle Coal	Alberta Block Coal Co. Ltd.	Drumheller	Drumheller
Newcastle Coal	Newcastle Jr. Mining Co. Limited....	Drumheller	Drumheller
Newcastle Coal	Newcastle Coal Co. Limited	Drumheller	Drumheller
National Coal	National Colls. Limited	Round Hill	Camrose
Nonpariel	Palisade Coal Co.	Three Hills	Carbon
Peerless Carbon	Carbon Coal Collieries Limited	Carbon	Carbon
Premier Coal	Reed & Brown Limited	Edmonton	Edmonton
Penn Coal	Penn Mine Coal Co.	Edmonton	Edmonton
Pembina Peerless	North American Colls. Limited	Evansburg	Pembina
Regal Coal	Regal Colls.	Taber	Taber
Rock Springs	Rock Springs Mine	Elcan	Taber
Renfrew Coal	Renfrew Coal Co.	Taber	Taber
Rosebank Coal	United Collieries	Alix	Ardley
Rosedale Coal	Rosedale Coal Co. Limited	Rosedale	Drumheller
Radium	Rosedale Coal Co. Limited	Rosedale	Drumheller
Raven Coal	Rosedale Coal Co. Limited	Rosedale	Drumheller
Rex (Upper seam)	J. D. Thomas Coal Co.	Nacmine	Drumheller
Rosemount Coal	Rosemount Coal Co. Limited	Aerial	Drumheller
Rose-deer Coal	Rose-deer Mining Co. Limited	Wayne	Drumheller
Round Hill	Round Hill Colls. Limited	Round Hill	Camrose
Southern Alberta Lethbridge	Southern Alberta Coal Company	Lethbridge	Lethbridge
Spicer-dinant	Spicer Coal Co. Limited	Dinant	Camrose
Star Coal	Great West Coal Co. Limited	Aerial	Drumheller
Standard Coal	Standard Coal Co. Limited	Wayne	Drumheller
Sunshine Coal	Sunshine Coal Co. Limited	Wayne	Drumheller
Sheffield Coal	Sheffield Colls.	Wayne	Drumheller
Saunders Creek	Big Horn & Saunders Creek Colls.	Saunders	Saunders
Sterling Coal (strip)	Sterling Colls. Limited	Basing, A.C.B.	Coalspur
Superior Yellowhead	Superior Colls. Limited	Edmonton	Coalspur
Victory Coal	Lakeside Coal Limited (Wabaman)	Edmonton	Pembina
Western Gem	Western Gem Coal Co.	Drumheller	Drumheller

ALBERTA DOMESTIC COALS

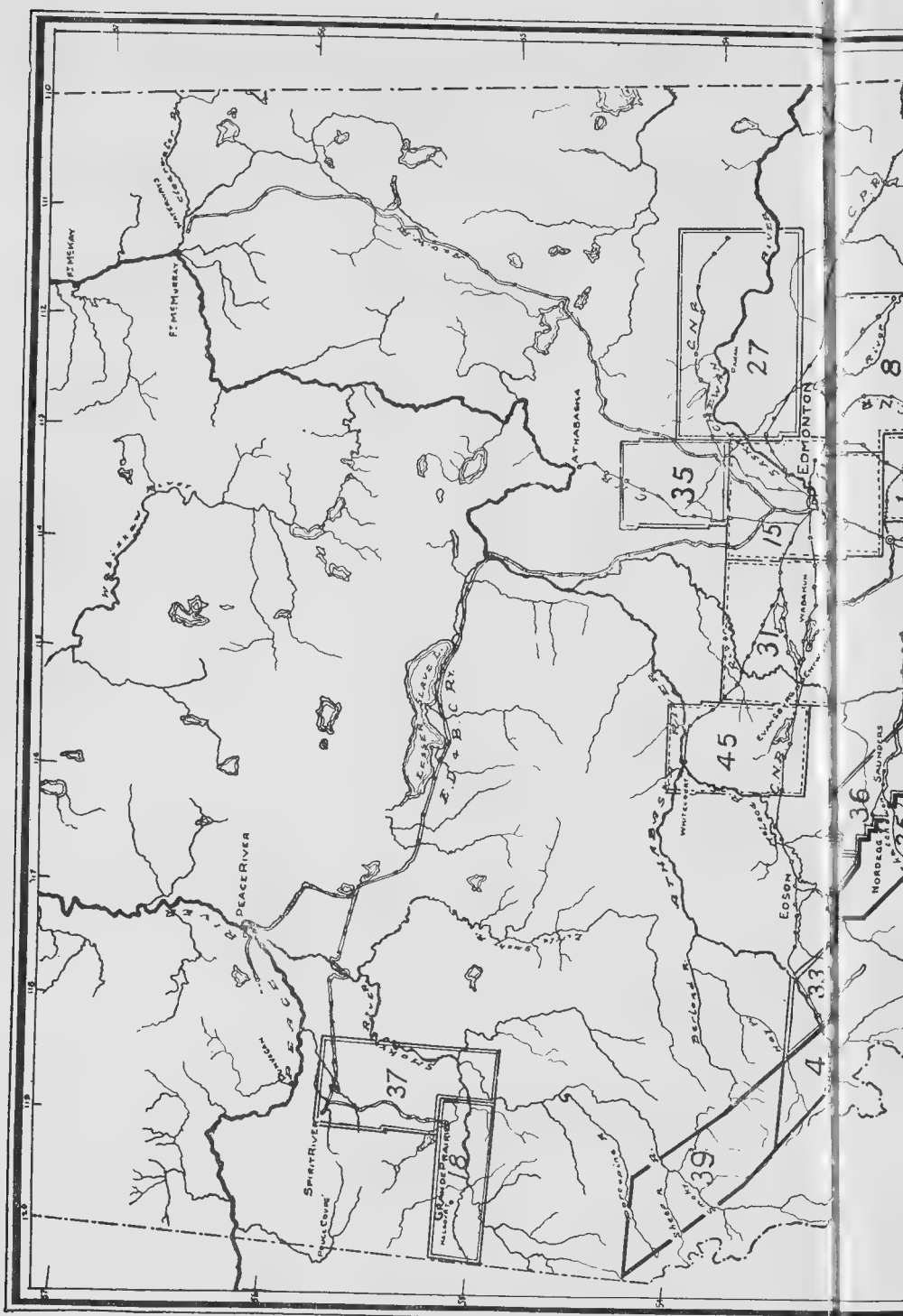
General Chemical Characteristics

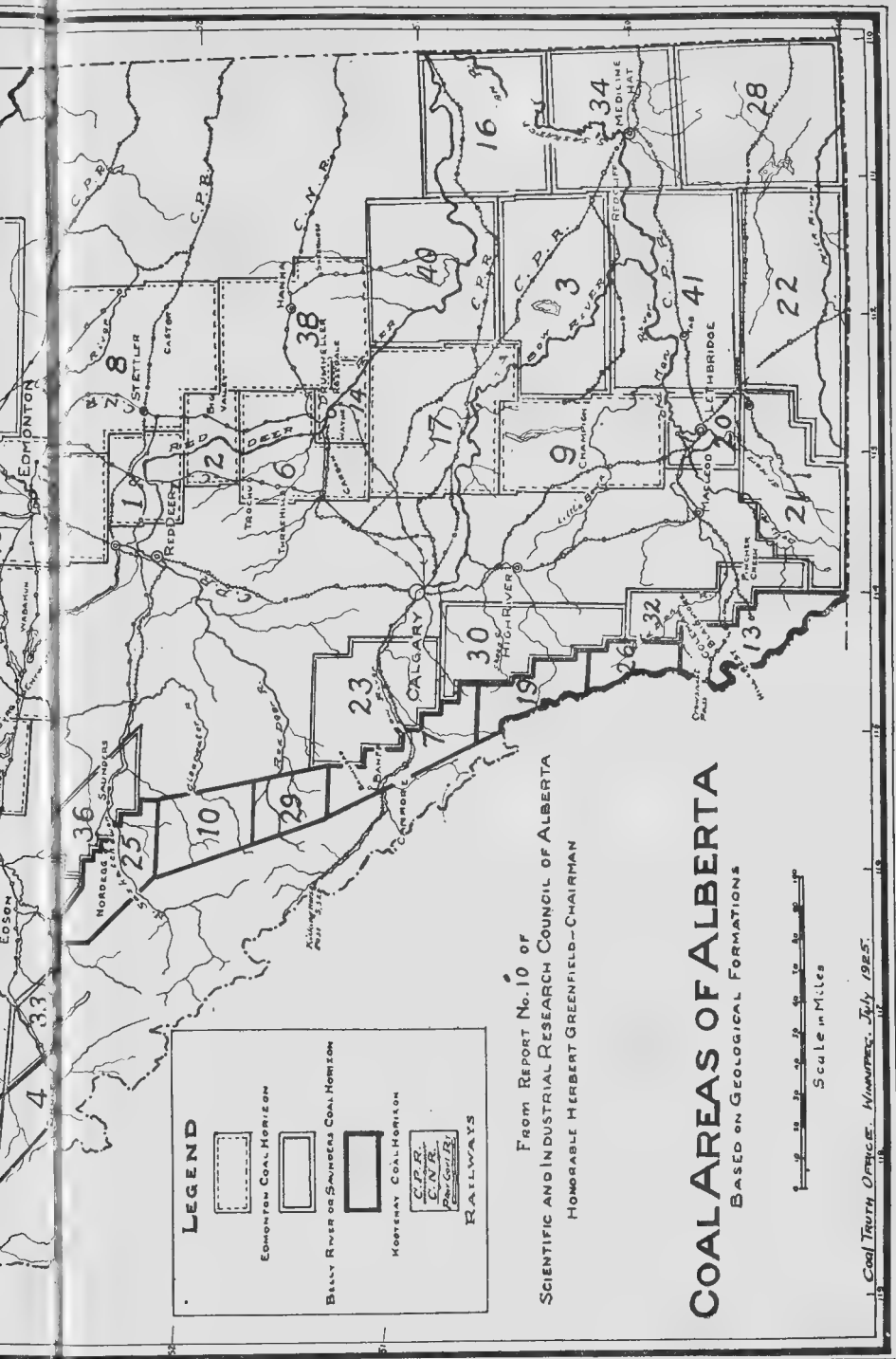
District	A & M Com- bined No.	Moisture			B. T. U.			Ash		Base		
		Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Moisture	Ash B.T.U.
Drumheller Upper ..	23	25.35	16.9	18.8	18.08	5.8	8.3	7.25	9,380	9,870	9,562	18.08 7.25 9,562
Drumheller Lower ..	20	25.04	15.0	18.5	17.41	5.7	9.7	7.63	9,373	9,890	9,664	17.41 7.63 9,664
Yellowhead	9	19.11	7.04	9.25	8.16	8.87	13.30	10.95	10,171	11,300	10,810	8.16 10.95 10,810
Three Hills	5	26.01	15.6	16.3	15.72	8.77	14.3	10.26	8,811	9,934	9,630	15.72 10.26 9,630
Carbon	4	26.20	14.8	15.6	15.21	10.4	11.7	10.94	9,450	9,712	9,582	15.21 10.94 9,582
Pembina	2	28.75	17.93	17.97	17.95	9.31	14.29	11.80	8,776	9,370	9,073	17.95 11.80 9,073
Victory	2	29.06	20.13	20.89	20.51	7.57	9.56	8.56	8,832	8,966	8,900	20.51 8.56 8,900
Lethbridge	6	19.27	8.66	10.5	9.72	7.32	13.19	9.55	10,640	11,277	11,000	9.72 9.55 11,000
Medicine Hat Redcliff	2	32.13	23.87	25.08	24.48	6.11	8.59	7.35	8,402	8,860	8,631	24.48 7.35 8,631
Saunders	7	16.2	8.3	10.7	8.87	5.37	9.8	7.38	11,156	11,820	11,490	8.87 7.37 11,490
Clover Bar	5	29.64	22.5	24.7	23.47	5.9	6.4	6.18	8,871	9,206	9,000	23.47 6.18 9,000
Taber	9	24.44	12.5	16.6	14.33	7.04	12.5	10.10	9,440	10,100	9,770	14.33 10.10 9,770
Camrose	7	32.31	25.0	29.2	26.82	4.2	7.7	5.50	8,280	8,910	8,520	26.82 5.50 8,520
Trochu	6	29.07	17.3	20.4	18.6	7.7	13.5	10.5	8,570	9,360	9,060	18.60 10.50 9,060

REPRESENTATIVE ANALYSES AND ANALYSES TAKEN FROM COMMERCIAL SHIPMENTS FROM THE PARTICULAR AREA

Note: Most of the samples of commercial shipments were taken in Winnipeg from cars on arrival by the National Testing Laboratories, Ltd.

Coal Area and No.	Combined Ash and Moisture	Moisture %	Ash %	Volatile Matter	Fixed Carbon	BTU's
1. Ardley	28.2	17.3	10.9	27.5	44.3	9,339
	29.82	18.23	11.59	28.26	41.92	8,911
	32.3	18.8	13.5	26.5	41.2	8,570
	26.1	18.4	7.7	30.1	43.7	9,360
	28.7	15.5	13.2	25.9	45.4	8,804
2. Big Valley	30.4	19.9	10.5	28.8	40.8	8,750
	33.0	21.7	11.3	28.4	38.6	8,370
	28.1	19.6	8.5	30.5	41.4	9,155
	32.7	20.9	11.8	28.5	38.8	8,380
3. Brooks	27.1	17.9	9.2	32.7	40.2	9,520
4. Brule	14.0	0.5	13.5	18.6	67.4	13,450
5. Camrose	31.0	25.4	5.6	29.9	39.1	8,770
	32.01	26.63	5.38	30.73	37.26	8,915
	34.10	27.9	6.2	28.8	37.1	8,277
	29.2	25.0	4.2	30.2	40.6	8,845
6. Carbon	26.08	15.58	10.50	32.42	41.50	9,800
	26.84	15.58	11.26	34.15	39.10	9,450
	26.14	15.65	10.49	31.61	42.25	9,557
	26.48	14.82	11.66	32.22	41.30	9,712
	23.80	16.50	7.3	31.0	45.2	10,040
	25.70	16.5	9.2	30.8	43.5	9,755
7. Cascade— Semi-Anthracite	11.4	0.8	10.6	16.3	72.3	13,500
Anthracite	14.2	0.6	13.6	8.8	77.0	12,890
(Mine closed)						
8. Castor	36.9	27.4	9.5	28.0	35.1	7,700
	35.1	29.3	5.6	29.7	35.4	7,870
	37.0	28.8	8.2	78.3	34.7	7,650
9. Champion	24.1	12.5	11.6	33.3	42.6	10,060
	21.7	12.6	9.1	34.3	44.0	10,380
10. Clearwater	No records available.					





Coal Area and No.	Combined Ash and Moisture	Moisture %	Ash %	Volatile Matter	Fixed Carbon	BTU's
11. Clover Bar	29.72	23.56	6.16	30.92	39.36	9,050
	29.96	24.08	5.88	31.40	38.64	8,933
	31.05	24.67	6.38	31.70	37.25	8,898
	28.53	22.55	5.98	30.80	40.70	9,206
12. Coalspur Representative		7.38	10.35	35.13	47.14	11,100
Group 1—Mined	17.73	8.13	9.60	35.43	46.84	10,945
	21.40	9.09	12.31	33.86	44.74	10,626
	17.28	7.37	9.91	37.86	44.56	11,303
	20.34	7.04	13.30	35.60	44.06	10,684
	16.42	7.55	8.87	32.83	50.75	11,180
	16.87	7.56	9.3	34.24	48.89	11,279
	24.00	9.67	14.33	30.11	45.89	10,450
Group 2—Mined	19.69	9.25	10.44	35.08	45.23	10,525
	21.23	8.59	12.64	35.58	43.19	10,482
	20.07	8.92	12.15	37.13	41.80	10,470
	23.96	9.94	14.02	32.72	43.32	10,188
	22.38	9.95	12.43	33.84	43.78	10,252
	22.18	7.63	14.55	33.07	44.75	10,179
	20.64	8.14	12.50	31.35	48.01	10,381
Group 3— Stripping	21.4	7.4	14.00	33.0	45.6	10,400
		7.4	20.3	30.4	41.9	9,727
13. Crow's Nest	13.0	2.5	11.5	24.9	61.1	13,140
	14.59	2.44	12.15	22.15	63.26	12,954
	15.70	2.44	13.26	20.96	63.63	12,620
	11.56	1.90	9.66	24.06	64.38	13,395
	16.92	0.92	16.0	25.10	57.38	12,800
		1.30	17.9	25.80	55.50	12,197
		2.10	16.1	24.60	57.2	12,227
14. Drumheller— Upper Representative		17.44	6.75	31.92	43.89	9,830
	23.30	19.46	3.84	33.07	43.63	9,870
	25.85	19.19	6.66	32.86	41.29	9,500
	23.86	18.62	5.24	31.43	44.71	9,820
	27.14	17.64	9.50	26.70	46.16	9,273
	26.10	18.11	7.99	32.72	41.18	9,450
	26.30	18.49	7.81	31.43	42.27	9,381
	23.57	18.23	5.34	32.66	43.77	9,850
	26.89	17.27	9.62	32.03	41.08	9,850
	24.19	17.44	6.75	31.92	43.89	9,830
	25.69	17.84	7.85	33.39	40.92	9,520
	24.76	17.28	7.48	31.66	43.58	9,710
	26.27	17.43	8.82	34.70	39.05	9,470
	23.13	18.23	4.90	33.99	43.48	9,973
	23.92	18.84	5.08	32.96	43.12	9,863
	30.11	17.78	12.33	31.40	38.49	8,922
Average		18.08	7.25			9,562
Lower Seam Representative ..		16.73	6.96	31.54	44.77	9,930

Coal Area and No.	Combined Ash and Moisture	Moisture %	Ash %	Volatile Matter	Fixed Carbon	BTU's
Lower Seam Representative ..	25.99	17.71	8.68	33.27	40.74	9,560
	23.94	14.84	8.10	30.94	45.12	9,910
	23.91	16.31	7.60	31.36	44.73	9,830
	23.69	16.73	6.96	31.54	44.77	9,930
	27.73	15.63	12.10	31.78	40.49	9,190
	30.98	17.69	13.29	30.69	38.33	8,805
	23.61	17.65	5.96	33.48	42.91	9,741
	25.54	18.26	7.28	35.00	39.46	9,630
	25.50	17.57	7.93	32.89	41.59	9,650
	24.19	18.68	5.51	31.78	44.03	9,730
	25.73	18.53	7.20	32.34	41.93	9,371
	25.15	16.41	8.74	34.48	40.37	9,950
	26.20	17.02	9.18	32.21	41.59	9,520
	26.09	16.78	9.31	33.06	40.85	9,470
	27.17	16.53	10.64	34.30	38.53	9,280
	25.66	18.37	7.29	33.33	41.01	9,550
	22.23	14.99	7.24	32.36	45.41	10,080
Average		17.41	7.63			9,664
15. Edmonton	29.72	23.56	6.16	30.92	39.36	9,050
	32.70	26.30	6.40	28.00	39.30	8,635
	32.30	25.60	6.70	28.90	38.80	8,592
	27.30	23.50	3.80	30.00	42.70	9,250
16. Empress	No records available					
17. Gleichen	No records available					
18. Halcourt	23.60	13.60	10.00	31.70	44.50	10,700
	No commercial records					
19. Highwood	No records available					
20. Lethbridge	19.28	9.73	9.55	37.16	43.56	11,000
	17.48	8.66	8.82	38.62	43.90	11,277
	20.10	10.50	9.60	35.20	44.70	10,945
	17.65	10.35	7.32	37.33	45.00	11,080
	19.80	9.90	9.90	35.20	45.00	11,000
	22.11	8.92	13.19	35.84	42.05	10,640
	18.50	10.00	8.50	36.00	45.50	10,987
21. McGrath	18.8	7.1	11.7	35.5	45.7	11,570
22. Milk River	25.9	13.4	12.5	30.6	43.5	10,070
23. Morley	No reliable data					

Coal Area and No.	Combined Ash and Moisture	Moisture %	Ash %	Volatile Matter	Fixed Carbon	BTU's
24. Mountain Park ..	12.99	0.96	12.03	27.35	59.66	13,320
	15.90	2.20	13.70	24.10	60.00	12,780
	15.90	0.70	15.20	25.20	58.90	12,760
	13.70	1.30	12.40	25.00	61.30	13,320
	19.10	3.70	15.40	19.70	61.30	12,507
25. Nordegg	12.10	0.70	11.40	16.40	71.50	13,500
	13.90	1.80	12.10	16.40	69.70	13,500
	15.30	0.80	14.50	15.10	69.6	13,110
	17.50	0.60	16.90	14.60	67.9	12,790
26. Old Man	No producing mines. Coal similar to No. 13.					
27. Pakan	No records available					
28. Pakowki	31.00	22.30	10.70	29.40	37.60	8,510
	46.90	37.50	9.40	27.80	25.30	6,060
	(Not commercial records)					
29. Panther	No records available					
30. Pekisko	18.30	8.80	9.50	35.10	46.60	11,650
	(Not commercial record)					
31. Pembina	27.28	17.97	9.31	30.62	42.10	9,370
	27.28	17.97	9.31	30.62	42.10	9,370
	32.22	17.93	14.29	28.20	39.58	8,776
	26.77	16.58	10.19	30.39	42.34	9,350
	29.90	19.10	10.80	27.40	42.70	8,954
	28.45	20.89	7.57	31.29	40.25	8,966
	29.68	20.13	9.55	30.92	39.40	8,832
32. Pincher	23.60	6.80	16.8	34.0	42.4	11,190
	(Not commercial record)					
33. Prairie Creek	No records available					
34. Redcliffe	31.83	24.48	7.35	30.24	37.93	8,630
	31.79	25.08	6.11	29.52	39.29	8,860
	32.46	23.87	8.59	30.96	36.58	8,400
	35.10	26.60	8.50	27.00	38.40	8,135
	33.10	26.30	6.80	28.00	38.90	8,443
35. Rochester	No records available					
36. Saunders	16.10	8.50	7.60	34.50	49.40	11,560
	13.99	8.62	5.37	33.32	51.69	11,813
	16.65	8.33	8.32	36.11	47.24	11,493
	17.80	8.40	9.40	32.34	48.86	11,304
	(Nut Pea)					
	17.56	8.76	9.80	35.13	46.31	11,276
	14.22	8.50	5.72	34.07	51.71	11,586
	15.17	8.42	6.75	33.98	50.85	11,652
	17.57	10.69	6.88	31.75	50.68	11,386
	18.41	10.03	8.88	33.61	47.98	11,156

Coal Area and No.	Combined Ash and Moisture Moisture	Moisture %	Ash %	Volatile Matter	Fixed Carbon	BTU's
37. Sexsmith	35.70	29.6	6.1	27.8	36.5	8,130
	(Not commercial record)					
38. Sheerness	29.70	24.10	5.60	29.70	40.60	8,730
	32.05	26.20	5.85	26.19	41.76	8,505
39. Smoky River	8.90	1.90	7.00	18.80	72.30	13,900
	No production from this area					
40. Steveston	No records available					
41. Taber	24.3	13.8	10.5	32.8	42.9	10,000
	21.32	14.28	7.04	34.09	44.59	10,113
	22.82	12.50	10.32	34.27	42.91	10,076
	24.79	13.42	11.37	35.77	39.44	9,955
	23.38	14.86	8.52	32.96	43.66	9,832
	25.94	13.42	12.52	32.82	41.24	9,512
	26.64	16.65	9.96	32.40	40.99	9,438
	23.40	14.24	9.16	32.63	43.97	9,865
	26.37	15.12	11.25	30.94	42.69	9,557
42. Toftfield	31.30	26.30	5.00	30.40	38.30	8,580
	32.10	27.00	5.10	30.00	37.90	8,547
	33.20	28.70	4.50	28.50	38.30	8,347
	33.50	25.00	8.50	29.80	36.70	7,990
43. Wainwright	No records available					
44. Wetaskiwin	No records available					
45. Whitecourt	No records available					

LIST OF "ALL" REGISTERED NAMES

Checked to March 31st, 1926

ARDLEY COAL AREA

Mine No.	Name of Mine	Name Registered
167	Ben Nevis Mines Limited	Mathewson Coal
731	Ed. Bray	Blackfalls Coal
809	Pearl Coal Company	Pearl of Furnace Coal
824	Sunbeam Coal Co. Limited	Sunbeam Coal
949	Geo. Paton	Paton's Sunlight
951	C. C. McDermand	Long Island Coal
969	James Blades	Great Bend Coal
986	Paul Ness	Perfection Coal
1018	Johnson & Whitlow	Dixie Coal
1049	Cober, Nix & Johnson	River Coal
1071	A. E. Holt	Erskine Coal
1135	Theo. Kurp	Kurp Coal
1185	Arthur J. Lewis	Crystal Coal
1221	Harry Cooper	Grandecourt Coal
787	Trusts & Guarantee Co. Ltd.	Ardley Hardite

BIG VALLEY COAL AREA

221	Big Valley Collieries Ltd.	B. V. C. Coal
328	Chas. Holme	Holmes Coal
471	C. W. Wooden	B. H. G. Coal
864	New French Coal Company	Vimy Coal
920	John Prescott	Scollard Coal
1019	James McKinlay	Special Coal
1190	Thompson Bros.	Breda Coal
1223	Peter Murray	Dumbarton Coal

BROOKS COAL AREA

226	Kleenbirn Collieries Ltd.	Kleenbirn Coal
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BRULE COAL AREA

429	Blue Diamond Coal Co. Ltd.	Blue Diamond Coal
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CAMROSE COAL AREA

241	John A. McLenhan	Spicer-Dinant Coal
244	Stoney Creek Collieries Ltd.	Stoney Creek Coal
374	Canadian Dinant Coal Co. Ltd.	Canadian Dinant Coal
601	George Law	Law Coal
610	L. Strilczyk	L. Strilczyk Coal
724	S. H. Burnstadt	Burnstadt Coal
760	Jacob Jacobson	Eskimo Coal
971	Daniel Colonel	Brandt Coal
1166	Banner Coal Co. Ltd.	Banner Coal

CARBON COAL AREA

113	Albert Trentham	Douglas Haig Coal
115	Peerless Carbon Collieries Limited	Peerless Carbon Coal
187	J. H. Oliphant	Carbon Black
189	A. Balog (abandoned)	Justice Carbon Coal
194	Rene Vassuer	The Old Ghost Pine Coal
384	Ellis Coal Company Limited	Knee Hill Valley Coal
444	Andrew Hanson	Lastchance Coal
445	George Watson	Bon Ami Coal
690	Ant Hill Coal Company	Ant Hill Coal
694	Joseph Hodgson	Prairie Pride Coal

Carbon Coal Area—Continued

Mine No.	Name of Mine	Name Registered
749	Carbon Gem Mine Co. Ltd.	Carbon Gem Coal
768	Shannon Coal Co. Ltd.	Shannon Coal
811	Palisade Coal Co. Limited	Palisade Nonpariel
817	H. Trentham	Renowned Coal
859	David Halbert	Justice Coal
906	Stahl & Wurz	Stahl & Wurz Coal
921	Thomas McKinlay	Meadow Bank Coal
1033	Emile Morrel	Black Jewel Coal
1201	Fife Coal Company	Fife Coal
1213	L. J. Shannon	Jasper Coal
1060	Aaron Balogh	Balogh Carbon Coal
315	Peters & Davidson	Ghost Pine Coal
1094	W. R. Cooke	Hot Dog Coal

CASCADE COAL AREA

2	Canmore Coal Co. Limited	Canmore Smokeless
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CASTOR COAL AREA

212	Richard Ruscoe	O. K. Coal
245	Bish Bros. & Le Gear	Bish Coal
251	John Tyrlik	Diamond G. Coal
273	Davis Green	D-G Coal
275	A. D. McCormack	McCormack's Coal
289	Armour Gray	Gray's Coal
427	Beni Hronek	Big Ben Coal
447	James Brothers	Ever-Ready Coal
607	D. McDonald	McDonald's Coal
615	G. H. Enders	Riverside Coal
666	E. W. Simmons	Rondda Coal
717	Dan Shaw	Shaw Coal
719	Fry & Somers	Fry's Coal
791	Richard Airey	Ladies' Delight Coal
793	Helmig and White	Hemig Coal
807	J. E. Calvin	Calvin Coal
902	J. B. Remillard	Remillard Coal
911	F. G. Meek	Radio Coal
945	Alfred McNeil	Brown Nuggett Coal
948	C. E. Hanson	Hanson Coal
952	Bohme Bros. & Gillis	Woodrow Coal
953	W. Robinson	Robinson Coal
956	Muncy Brothers	Eastern Gem Coal
959	Haywood & Kerr	Spig-Night Coal
964	John Cober	Black Lump Coal
1032	Campbell & Walter Bros.	Western Pride Coal
1042	John Carlson	Carlson's Coal
1046	Louis Bulcourt	Moonshine Coal
1062	Charles Strader	Esperanze Coal
1064	David James	Windsor Coal
1102	Axel Lindgren	Lindgren Coal
1180	Titus Card	Ferry Bank Coal
1181	Saunders & Gaush	Fleet Coal
1202	W. Jones	Mother's Pride
1203	A. G. Rodway	Deep Seam Coal
1205	John Armstrong	Castor Home Comfort
1210	Cliff Warmoth	Warmoth Coal
1216	Sebastian Martin	Quick Light Coal
1218	E. D. Allen	Allen's Coal
273	Davis Green	D. G. Coal
275	A. D. McCormack	McCormack's Coal
245	Bish Bros. & Le Gear	Bish Coal
251	John Tyrlik	Diamond G. Coal
1220	Norman & Hogan	Norman's Best Coal

CHAMPION COAL AREA

Mine No.	Name of Mine	Name Registered
136	George Rhodes	Therriault Coal
151	John Hunter	Reid Hill Coal
224	Fred Hetherington	Hetherington Coal
296	James Ashmore (abandoned)	Jubilee Coal
739	W. E. Watkins	McNaughton Coal
758	Alex Fraser	Fraser's Gold Nugget
910	James Ellis	Thighill's Coal
1139	Mrs. Armstrong & Cornish	McGregor Coal
1137	M. Popovitch	X-L Coal
685	Geo. Rhodes	Snake Valley Coal

COALSPUR COAL AREA

769	Sterling Collieries Limited	Sterling Coal
771	Foothills Collieries Limited	Foothill's Coal
775	Balkan Coal Co. Limited	Minehead Coal
846	Saunders Ridge Coal Co. Limited	McLeod River Hard
1002	Coal Valley Mining Co. Limited	Cova Coal
1014	Reco Hard Coal Co. Limited	Reco Hard Coal, changed to
	Elkhead Collieries Limited	Elkhead Coal
1157	Bryan Coal Co. Limited	Bryan Coal
833	A. Dino & Company	Superior Yellowhead

CROW'S NEST COAL AREA

40	Hillcrest Collieries Limited	Hillcrest Coal
87	West Canadian Collieries Limited	Bellevue Coal
88	*International Coal & Coke Co.	International Coal
133	Mohawk Bituminous Mines Ltd.	Mohawk Coal
199	Smith Brothers	Beaver Coal
204	McGillivray Creek Coal & Coke Co. Limited	McGillivray Creek Coal
295	J. H. Owen	Christie Coal
296	West Canadian Collieries Limited	Green hill Coal
715	Richard Murtland	Peerless Coal
802	Sunburst Coal Co.	We Usit Coal
1065	Spokan & Alberta Coal & Coke Company	Tent Pass Coal
1199	Rhodes Mining Company	Rhodes Coal
	*Producing Domestic Coke.	

DRUMHELLER COAL AREA

317	Newcastle Coal Co. Limited	Newcastle Coal
346	Rosedale Coal Co. Limited	
	Upper seam	Raven Coal
	Lower seam	Rosedale Coal
	Upper seam	Radium Coal
347	Rosedale Coal Mining Co. Ltd.	Rosedale Coal
367	Midland Coal Mining Co. Ltd.	Midland Coal
402	J. D. Thomas Coal Co. Limited	Champion Coal
	Upper seam	Rex Coal
436	Great West Coal Co. Limited	Star Coal
436	Great West Coal Co. Limited	Carbonite Coal
464	Burton T. Brooks	Maple Leaf Coal
620	Alberta Block Coal Co. Ltd.	Newcastle Coal
640	Western Commercial Co. Ltd.	Commercial Coal
642	Jewell Collieries Limited	Jewel Coal
675	Murray Collieries Limited	Murray Coal
678	Western Gem Coal Co. Limited	Western Gem Coal
684	Atlas Coal Co. Limited	Atlas Hard Coal (lower seam)
695	Caledonian Collieries Limited	Scranton Coal
703	Excelsior Collieries Limited	Excelsior Coal
734	Rosemount Coal Co. Ltd.	Rosemount Coal
737	Superior Grade Coal Co. Ltd.	Sunshine Coal
764	J. E. Perry	Hi-Heat Coal

Drumheller Coal Area—Continued

Mine No.	Name of Mine	Name Registered
770	Ostrom Coal Company	Ostrom Coal
776	Hy-Grade Coal Co. Limited	Hy-Grade Coal
782	Hi-Heat Coal Company	Hi-Heat Coal
815	J. L. & Joe Debrinski	Rosebud Creek Coal
816	Newcastle Coal Co. Limited	Newcastle Coal
819	Elgin Coal Co. Limited	Elgin Coal
844	Ideal Coal Co. Limited	Ideal Coal
848	Mid-West Collieries Limited	Mid-West Coal
931	Robert Taylor	East Coulee Coal
974	Ontalta Collieries Limited	Castel Coal
1008	William Watson	Watson's Coal
1115	The Craig's Coal Co. Limited	Craig's Coal
1117	Harbour & Bale	Beynon Coal
1154	Radiant Coals Limited	Alberta Radiants
1207	R. Barber	Unity Coal
1212	W. J. Tabor	Burts Coal
1214	W. T. Clapham	Reliance Coal

EDMONTON COAL AREA

29	Mrs. Mary Borube	White Star Coal
32	Canadian Coal Co. Limited	King Coal
69	Keith & Fulton	Keith & Fulton Coal
90	Fraser MacKay Collieries Ltd.	Black Gem Coal
91	R. P. Ottewell Coal Mine	Clover Gem
99	Great West Coal Co. Limited	Black Diamond Coal
101	W. Dickinson & Knight	Bell Coal
129	North Star Coal Co.	Alberta Star Coal
147	Penn Mines Limited	Edmonton Chinook
155	Dawson Coal Co. Limited	Dawson Coal
389	Frank Smith	Smith Coal
397	Kelly Collieries	Sturgeon Coal
428	Sturgeon Bailey Collieries Ltd.	Cloverdale Coal
632	Penn Mines Limited	Penn Coal
699	Marcus Coal Mines Limited	Marcus Coal
707	Mrs. A. J. Davidson	Beverly Coal
868	Frank Chiarello	Chiarallo Coal
869	Premier Coal Co. Limited	Premier Coal
886	Iiko Sereda	Sereda Coal
888	Magnus Pearson	Calmar Coal
1022	Fridel & Barton	Fridel Coal
1098	Wm. Eccleston	Namao Coal
1091	Rabbit Hill Collieries	Rabbit Hill Coal
1099	Steve Pohlko	Knie Coal
1167	George & Harry Booth	B. B. Coal
1177	Steve Pohlko	Steve Pohlko
1197	Farmers Coal Co. Limited	Farmers' Coal
950	Fred Hook	Hooks Coal
1034	Kost Nimko	Nimko Coal

GLEICHEN COAL AREA

299	Dominik Medloski	Medloski Coal
360	H. Castello	Castello Coal
857	Jas. A. Batie	The Evans Coal
1111	Jas. A. Batie	The Evans Coal

HALCOURT COAL AREA

1134	Robert Dunbar	Dunbar Coal
849	H. J. Mouser	Mous-Bing Coal
1176	Adolph Hugel	Wapiti Coal
1118	A. C. Schanuel	Schanuel Coal

LETHBRIDGE COAL AREA

Mine No.	Name of Mine	Name Registered
3	Canadian Pacific Railway (Dept. of Natural Resources)	Galt Coal
54	C. S. Donaldson Coal Co.	Federal Coal
104	Consolidated Diamond Collieries	Lethbridge Coal
174	North American Collieries Ltd.	Lethbridge Imperial
203	Andrew Molloy	Molloy Coal
395	New Barnes Coal Mine Co.	New Barnes Coal
676	Lethbridge Coal Co. Ltd. (abandoned)	Lethco Coal
713	Peacock & Stabbs	Lethbridge Pioneer
738	Geo. Rollingson	Whoopup Coal
750	John Noble	Fire Light Coal
889	Ben Welsh	Shell Coal
981	John Rollingson	Elite Coal
983	Warren & Adair	Big 3 Coal
1045	Bembridge & Jackson	Nord Blad Coal
1086	Benjamin Oliver	Oliver Coal
1095	Royal Lethbridge Collieries	Royal Coal
1109	Lund, Nelson, Hagblad and Sadlis.	Royal View Coal
1110	McNabb & Sherman	McNabb-Sherman Coal
761	Southern Alberta Coal Co. Ltd.	Southern Alta. Lethbridge
871	J. F. Hamilton	Hamilton Coal
192	City of Lethbridge	Lethbridge City Coal
821	McNabb Coal Company	Lethbridge Premier
55	Geo. F. Russell	Russell Coal

MAGRATH COAL AREA

316	Evan Evans	Little Victor Coal
650	Telley H. Jensen	Beazer Coal
1009	Alex Noble	Noble Coal
1198	Low & Stutz	Hillview Coal
458	P. D. Miller	Gilruth's Coal
996	Sam Vare	Sunny Hill Coal

MILK RIVER COAL AREA

271	Coghill & Hughes	Economy Coal
279	E. T. Davies	Davis Coal
381	T. E. Simpson	Lucky Strike Coal
881	F. W. Walters	Best Coal
1105	Thomas Taylor	Flint Coal

MORLEY COAL AREA

1153	Wm. W. McGlasking	Bow Valley Coal
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NORDEGG COAL AREA

256	Brazeau Collieries Limited	Brazeau Bituminous Steam Coal
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MAKOWKI COAL AREA

341	Carl Perini	Perini Coal
602	Walter Reville	Nigger Head Coal
689	George Bragdich	Thelma Coal
718	F. Rataushk	Eagle Butte
903	Harry Last	Lakeview
965	Comrey Coal Co.	Comrey Coal
1138	Wm. Geddes	Plume Coal

PEKISKO COAL AREA

Mine No.	Name of Mine	Name Registered
70	L. F. Rathbun	Riley Mine Coal
858	J. W. Little	Little's Coal
924	A. D. Salisbury	Apex Coal
1004	Francis DuRocher	High Coal
1061	Ernest Skeen	Skeen Coal
1215	Dave B. Blacklock	Auld Acquaintance Coal
361	Fish Creek Coal Co.	Fish Creek Coal

PEMBINA COAL AREA

227	North American Collieries Ltd.	Pembina Peerless
419	Lakeside Coals Ltd. (Wabaman)....	Victory Coal

PINCHER COAL AREA

76	Carrett Collieries	Shamrock Coal
1096	J. L. Patton	Patton Coal
1108	F. L. Mouysset	Bob Creek Coal
1132	Marlow Mine	Blazer Coal
1175	Thomas Tonge	The Long Flame Coal

REDCLIFFE COAL AREA

772	Ajax Coal Co. Limited	Ajax Coal
165	Redcliffe Birch & Coal	Redcliffe Peerless

SAUNDERS COAL AREA

388	Bighorn & Saunders Creek Colls....	Bighorn & Saunders Creek Coal
852	Alexo Coal Co. Limited	Alexo Coal
756	Saunders West Co. Limited	West Saunders Coal

SHEERNESS COAL AREA

354	R. W. Clack	Handhill Best Bright Coal
375	Allan S. Jones	Garden Plain Coal
443	W. J. Anderson	Anderson Coal
477	Lindsay & Graham	Delia Mine Coal
486	C. E. Brown	C. E. Brown Coal
488	Robert Unsworth	Unsworth Coal
491	L. C. Treber	L. C. Treber Coal
496	Alfred Donald	A. Donald Coal
497	A. T. Morse	Morse Coal
611	L. Dafoe & Brothers	Solon Coal
646	James Bradshaw	Bradshaw Coal
862	James Wright	Wright Coal
937	Perrotha & Carravaggio	Gopher Coal
995	J. Worneboldt	New Walker Mine
1039	Lawrence Anderson	Clear Lake Coal
1184	Nels. F. Engstrom	Engstrom Coal

SEXSMITH COAL AREA

1121	H. A. McGrath	Badheart Coal
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TABER COAL AREA

82	Bay Coal Company Limited	Bay Coal
105	Majestic Collieries Limited	Majestic Coal
170	Co-Operative Coal Company	Rock Springs Coal
180	J. J. Mills	Little Wonder Coal
201	Lewis Oliver	Goldenwest Coal
377	G. S. Gibson & Son	Morning Star Walsend

Taber Coal Area—Continued

Mine No.	Name of Mine	Name Registered
448	Louis Santoni	Burn Bright Coal
672	Dominic Annon	Acadia Coal
691	A. J. Cutland	Jackson Coal
909	Dunn & Shawcross	Burnkleen Coal
987	Ferens & Matlock	Monarch Coal
1003	Vittorio Carraini	Carraini Coal
1010	Henry Miller	Glowing Diamond Coal
1031	Peter B. Barr	Barr Coal
1079	Barnwell Community Mine	Barnwell Community
1097	Louis Domso	Prairie Coal
1114	C. Lanz	Lanz Coal
1122	Renfrew Coal Company	Renfrew Coal
1124	Oliver Coal Company	Invincible Coal
1140	Jules Lavenne	Home Comfort
1145	Kergan & Grant	Bridge-End Coal
1196	Theodore Spencer	The Spencer Coal

TOFIELD COAL AREA

215	Chappell Coal Co. Limited	Dollar Coal
252	Tofield Coal Co. Limited	Headlight Coal
340	Dobell Coal Co. Limited	Dobell Coal
1107	Morris & Swift	Black Nugget
1172	Bardo Coal Co. Limited	Black Star
1206	Ben Steffen & Company	Ryley Coal

WETASKIWIN COAL AREA

1174	J. W. Walker	Walker's Coal
1209	Golies & Jones	Cambrian Coal
1211	Hobbema Coal Co.	Hobbema Coal

WHITECOURT COAL AREA

1084	Albert Quist	Black Flint Coal
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MOUNTAIN PARK COAL AREA

282	Mountain Park Collieries Ltd.	Mountain Park Coal
693	Cadomin Coal Co. Limited	Cadomin Coal
905	Luscar Collieries Limited	Luscar Coal

ANALYSES OF COAL AS RECEIVED BY THE CONSUMER

59. The purpose of the publication of the analyses given here is to inform the ultimate purchaser within reasonable limits the quality of the coal which he expects to receive and to give him in a general way knowledge of the various shipping fields.

Coal in the ground is the raw material from which the coal delivered to the buyer is manufactured.

Coal as found in the seam in the ground may be very free from ash, and which could be proven by a careful selection of a sample from the seam for analysis, but in mining this seam as a commercial undertaking it might be that it is impossible to get out the pure coal seam without disturbing the seams of impurities (bone, rock, clay or shale). Consequently, the commercial product would be much higher in ash than that shown in sample taken from the seam.

Or in the reverse.

A workable seam of coal might be six feet in thickness. This seam might be made up of bands of coal very free from ash, intersected with bands containing more ash and with very thin bands of practically all ash.

60. In sampling such a seam it is usual to take a vertical sample of the full thickness of the seam. When this average sample is analyzed it may show a very high percentage of ash.

The analysis, however, is a scientific record of the particular seam, and is usually published as a standard for the seam.

Although the operator who mines that particular seam has of necessity to mine the whole of that seam, he can, and usually does, remove a large part of the impurities after the coal has been brought out of the mine. Some impurities are picked out by hand, some are screened out, some removed by washing with water and some can be removed by air separation.

It will be realized by the reader that either and all of these operations cost money, and that the amount of ash in the resultant product depends upon the amount of money which the operator can spend for cleaning purposes and maintain a selling price low enough to market his coal.

He has, however, improved his product over that in which it was found in the ground, and is therefore entitled to quote an analysis made from his marketable product in preference to that given in the scientific record of his coal seam.

For instance, an official Alberta Government published record of the average for seams in the Crow's Nest is 12,400 B.T.U.'s, but one mine has spent a large amount of money in installing cleaning equipment, and consistently produce a commercial product of over 13,000 B.T.U.'s. Others are following suit, so that when these get operating the present official analysis is a great disadvantage when offering coal in a market where foreign coals compete and submit authentic records of higher value, but of which the commercial product may be no better or not as good as the Alberta product upon a B.T.U. basis.

61. Remember that analyses are like finger prints. You must never expect to get delivery of a coal exactly like a submitted analysis down to its last detail.

If in your business a certain analysis is quoted you, compare it with those given here on the particular class of coal. If each item comes within the maximum and minimum limits it is within reason. Then compare its combined ash and moisture with the quoted B.T.U.'s. If these compare reasonably with those given here you are safe to continue with your negotiations.

Any analysis which is submitted to you should, to be fully acceptable, have been taken by a competent sampler, sealed airtight and shipped in that manner to the analyst. The analysis should also state that it is a report on the sample as received by the analyst. This information should be stated on the record.

Most of the analyses given here were taken in Winnipeg upon the arrival of the car, by the analyst or his representative.

Most of the figures given are carried out to two decimal places. This is not necessary practice, but as it has been usual in Winnipeg when checking samples for the purchaser the same method has been followed in order that comparison may be the same, but the final decimal figure may be neglected if desired.

It will be noted that several (Drumheller, for instance) have a representative analysis given, as well as an average. The representative is what you should expect from one of the well-established brands. The average figure is spoiled by the inclusion of samples taken from cars shipped by newer mines.

Moisture in Coal

62. If you are offered coal with a moisture content considerably below those shown here, and you are told by the party submitting it that it is due to moisture loss in transit, dispute that statement. The tests made in Winnipeg demonstrate that the moisture loss in transit is practically nil. This series of tests also refutes the claim that the loss in weight in transit is due to evaporation.

It can be accepted by dealer and purchaser that the moisture content is a standard quantity in all coal in a particular district unless the mine is a wet mine, in which case the coal received will be surface wet or show indications of having been wet.

Ash

63. The ash content is the variable which is largely under the control of the producer. The average from the district cannot be complained of, but the purchaser should not expect greater than the average.

64. A check upon the possible B.T.U. value can be made by combining the non-combustible (moisture and ash) and checking with the value given.

The volatile and carbon content are not of much indication for difference in value on coals from the same districts. These two items are only of value for an approximate comparison of coals from

different districts; even then it is dangerous to set any rules by them until you have seen the coals being burned in competition with one another.

For general business where the tonnage is not large enough to stand the cost of regular periodical sampling and analysis, the dealer or ultimate purchaser may protect himself against substitution by checking the documents received with the coal, to place the "place of origin" of the shipment, and to analyze the coal for ash content only.

The B.T.U.'s (Beaty Yews)

65. The information given above is for the purpose of permitting you to check for its scientific value in B.T.U.'s if you think that you are interested in Beaty Yews.

The following is now submitted so that you can delegate the B. T. U. value to the place where it belongs in the scale of actual values according to the purpose of the use of the coal.

If you have two coals which you are comparing for value to be received, and they are exactly similar in burning characteristics, size and preparation, and will, if purchased, be used in the same equipment, you may make comparison by the B.T.U. basis. But if you have another coal to consider with them, and that coal has different burning characteristics, or the same coal in different size or preparation, you cannot compare them on a B.T.U. basis.

The B.T.U.'s are not in any coal when you purchase it. It is the skill of the user, the type of equipment, the class of service, the rate of burning, the size of the coal, the draft, the burning characteristics of the gas off the coal, the burning characteristics of the coke from the coal, and others, which create the B.T.U.'s.

INFORMATION REQUIRED BY THE COAL DEALER

66. Information to be given by a coal purchaser to a coal dealer or salesman:

- A. I have a (Power Plant), (House), (Block), for which I require coal.
- B. The plant is used for steam power), (for steam distribution), (for heating), (cooking).
- C. It is operated (by mechanical stokers), (hand fired), (fireman on duty all the time).
- D. It is operated (continuously throughout the year), (during the winter only), (at intermittent periods).
- E. The draft is supplied by a (chimney), (induced draft fan), (blower under the grate), (draft is good), (draft is bad).
- F. (The rate of operation depends upon weather conditions), (I require a large quantity of steam quickly for a short period), (I have periods during the day or night when very little steam is required), (fires are kept banked).

- G. I have in the past burned (so and so coal), (this has been satisfactory), (this has not been satisfactory), (I desire a change of coal), (coal burns too fast), (coal burns too slow), (there is too much small), (good coal shakes through the grates).
- H. (I am changing my fireman), (I am changing my plant).
67. Questions for dealer, or salesman, to put to the coal purchaser:
- J. Answers to all those submitted by the coal purchaser.
- K. If the answers do not permit you to determine the class of coal most suitable, look his plant over yourself.

COAL FOR POWER PLANTS

L. If the fuel is required for a power plant consider first the "Bituminous Coals." If for ordinary chain grate, Babcock setting, a free burning Bituminous coal (Nut Slack) or (Slack). If chain grate is equipped with a "coking plate" (Slack bituminous caking coal). High moisture coal cannot be effectively burned with this setting, nor can low volatile coals. If the chain grate is of the forced draft under the grate type, any non-caking low moisture or high moisture coal may be burned, but the type of coal best suited depends upon the service required. If ordinary chain grate, natural or induced draft with high furnace setting, and overhung bridge wall dump, the coals best suited are Black Lignite containing from 10 to 18% moisture (Nut Slack) or (Pea Slack). Brown Lignite containing up to 30% moisture can be burned on these grates, but unless special high draft is provided the boiler rater will be below normal. Low volatile coal cannot be effectively burned with this setting.

If with the chain grate trouble is experienced by loss of ignition where the coal enters the furnace, the trouble is often caused by having pieces of coal too large which in passing through the hopper remain on top of the fuel bed. As the speed of ignition depends upon the surface of the fuel in contact with heat, large pieces must of necessity take longer to ignite than small pieces. Remove or break up the larger pieces, or divide the feed hopper so that the lumps will rest on the grate and the fines on top.

The best size coal for chain grates is $\frac{1}{4}$ by 1 inch, not more than 20% of which should be 1 inch.

A chain grate will only work at its best when the combustion chamber is "good and hot." If the fuel is burned out before reaching the dump the chamber cannot be "good and hot," too much air leaks through the bed of ashes. It is more economical on fuel, and better service can be obtained if a small amount of live coal is dumped with the ashes than if all coal is burned before reaching the dump. This recommendation is the reverse of general practice, and it is suggested by the writer that those who would dispute its accuracy should try it during a period when service is measured.

Another piece of unsolicited advice is "do not have too clean a dump." Keep some ashes on to prevent the air leakage. Air leakages cool off the bridge wall. It is the radiation of heat off

the bridge wall which does more to ignite the coal as it enters in front than does the so-called ignition arch in front. If the front arch gets cool, or will not get hot, make a hot fire against the bridge wall and notice the improvement.

Coal larger than one inch makes holes in the fire. A lump of coal will jam in the feed door and sweep the grate bare at that point. Clinker on the side walls sweeps the grates bare at the sides. Chain grates will not function properly unless the whole of the grate is covered.

Moistened coal will fire easier than dry coal and less will riddle through the grates. A steam jet in the coal chute will moisten the coal better than a hose.

The chain grate is smokeless.

Underfeed Stokers

68. The underfeed stoker will "burn" any kind of fuel, but will not give best results with "all" kinds of fuel. An ordinary installation has its greatest efficiency and capacity with a free burning bituminous coal, not too heavy caking.

Special draft and furnace design is required for full efficiency on high moisture brown lignites, as is also the case with low volatile coals.

For the middle rank Black Lignites and coals the furnace temperature is not so important as with the chain grate for ignition. If the furnace temperature is too high clinker will result.

Caking bituminous coal is best in Nut Slack preparation, free from lumps; with slightly higher draft than normal, practically any rating can be obtained with caking Nut Slack.

Underfeed stokers are more satisfactory with a low setting than the chain grate, but a low setting requires a high grade fuel, and boiler ratings are limited, except by excessive black smoke. It pays to have a high setting, in service and economy.

Overfeed Stokers

69. Coal for overfeed stokers should be selected for its low clinkering qualities on account of the usual high furnace temperature.

The characteristics other than B.T.U.'s of the coals have considerable to do with the ratings obtained. Lump coal is more suitable than small. High moisture coal requires burning in a very thick bed and coal must be free from slack.

Selection of the Alberta fuels should be made by trial and effect.

Turbine Grate

70. The turbine grate fills a gap which was required for the small plant. There was no small mechanical stoker within economic range that would operate on all the various coals offered.

The turbine grate is not an automatic stoker, if by automatic is meant only throwing in the fuel, but it is automatic in the way

that it has a wide range of capacities at high efficiency and can handle a wide range of fuels very divergent in characteristics.

It takes over from the fireman much of the skill in firing. So long as coal is thrown in and ashes removed a wide range of service can be maintained.

It consists of a grate closed to the ash pit. The necessary air for combustion is obtained through the grate bars. Each grate bar is fitted with a small steam jet which draws in the air in volume depending upon the steam pressure. This air and steam is forced through small orifices in the grate bars at high pressure; this keeps the fuel bed in a constant state of turmoil and prevents the formation of large clinker. All coals can be burned with this grate. Coals low in B.T.U. value, high in moisture, or high in ash are equally effective in producing high ratings, but where high ratings are required high settings are a necessity.

The furnace has its highest capacity with sub-bituminous coal, nut pea sizes; equally high fuel efficiencies can be obtained with the higher moisture coals of any moisture content but the ratings are reduced. The ratings, however, do not follow the same line of reduction as the increasing amount of water content on account of the fact that the higher the moisture the more free burning the fuels usually are.

High efficiency can be obtained from the Bituminous coals, but they do not have the range of capacities nor give the quick response that results from the lower rank coals.

The turbine furnace was originally developed for the fire tube boiler, Lancashire and Marine types, but in Winnipeg and the West it has been very effective for the return tube boilers.

Other furnaces of similar nature are now being placed on the market. Time will prove the value of same.

Sprinkler Stoker

71. The Sprinkler Stoker is a stoker made for the small boiler. Coal is fed to a set of revolving blades which flips it into the furnace and spreads it over the grate. It has the objection that each class and size of coal requires special setting of the speed and tension of the flippers. If the coal varies in specific gravity it spreads the coal unevenly over the grate surface. Coal higher in ash is higher in specific gravity, and is segregated in distributing it, which causes clinker.

As it is not good policy to instal equipment for one grade of coal only, and as Alberta has so many grades, this type of stoker is out of the question in this market.

There are also what are called hand stokers, in which the fireman has only to throw the coal in. The spreading is done by the movement of hand-operated levers.

Hand Firing

72. Most of the small plants are hand fired, and as this is not a treatise on firing little will be remarked other than:

A good fireman can obtain higher efficiencies on the small plant with irregular loads and irregular coals than any mechanical stoker, but there are "few good firemen" who remain as firemen. They are usually promoted, or get into other lines of business, so that on the whole the dealer and coal producer must work on the basis that firemen are unskilled except in certain coals which they have become used to in the particular plant where they are located. If the dealer or producer desires to obtain results from such fireman on a coal which he is not used to, he must take the responsibility of instructing the fireman, and must expect from that fireman negative help until he has been fully converted.

It will help in such cases if the dealer will put himself in the fireman's position and show the fireman in actual practice that he is not being asked to do more with the coal than is possible.

You will run across firemen who advise that they have spent their whole lives firing and that there is nothing that they do not know about firing. Don't try to convince such a man with words. He believes in himself, so cannot believe you if you differ in ideas. Take off your coat and show him with the shovel, or tell him of some particular problem that you have and ask his help. That usually sets the limitations of knowledge.

Where a fireman is kept on duty at all times, the class of fuel that he can burn is limited to the fireman's skill and the equipment he has to burn it in. If he is a fully skilled fireman he can burn all classes of coal with more or less success.

If the fireman has other duties which take him away from the boiler room more selection must be made of the coal. It must maintain the load during the period of his absence. In this case efficiency of firing has of necessity to be secondary to the characteristic quality of the coal. Bad characteristics and bad firing do not help for results. Bad firing must be balanced with coal of good "characteristics" for the occasion. (Note: That it is not only B.T.U.'s that make good coal.)

If firing the furnace is only a side line for the attendant, and is only done at long periods, the characteristics of the coal must do all the work of firing except throwing itself in. In such case do not expect a coal which requires for best results a fireman all the time to prove satisfactory. "Again forget the B. T. U.'s."

Draft

73. If the complaint is that the coal is too slow, and you know it is the same coal as has been used all along, first look at the fire to see that it is being fired right, then check up the chimney connection, smokepipe, and boiler setting for air leaks. Look to see if the damper has worked loose on its spindle. After you have satisfied yourself that these are not responsible, look at the coal to see if

the size has been reduced. If it is slack, try putting some nut with it. If that does not work out screen out the dust. Don't try to pass the "verbal buck" to your customer; find out what is wrong and who is in the wrong, then use diplomacy in placing the blame if you want to keep your customer.

If by the above checks you find that the coal is still too slow try changing the coal to one having more free burning characteristics (again forget the B. T. U.'s).

If the complaint is that the coal burns too fast, check first the damper operation. If you believe that the attendant will not consistently use the damper (if there is such a thing in operating condition), reduce the size of the coal and thicken up the fuel bed. If it is a bituminous coal give it a little more slack.

If the plant has been in operation for years, and was satisfactory in the past, and that no changes have been made, "do not accept as correct a complaint on the draft." With all things as they were, a change in the climate is the only thing which would change the "draft." Find out the real reason!

74. All coal salesman cannot be fully qualified combustion engineers; if they were the majority would not be selling coal; but every coal salesman should have a knowledge of the particular points of his talk so that he can talk intelligently.

The coal salesman talks learnedly of B. T. U.'s. He should know that the value of one B.T.U. is the amount of heat required to heat one pound of water one degree Fahrenheit.

75. He should know that CO_2 is not a summer drink, and that in burning coal the solid fuel is changed by heat and contact with oxygen into a gas, in which one part or one unit of carbon in gaseous form combines with two parts of oxygen. In making this combination it gives up "all" the available heat.

The oxygen is obtained from the air admitted under the grate and over the fire.

By taking a small measured volume of the gases leaving the fire after they have given up their heat and measuring the proportion of CO_2 which it contains in percentages of the whole volume, the percentage of CO_2 can be recorded.

The measurement is a simple operation and is done with a simple device. The sample of gas which has to be tested is brought into contact with a chemical which absorbs the CO_2 . This reduces the volume of the gas in proportion to the amount of CO_2 ; the result is read off direct on the dial or indicator tube on the device.

Theoretically the percentage can be slightly over 20, but as we are referring to practical operation instead of scientific we will deal with what can be obtained in practice.

If a plant has automatic recording CO_2 instruments which are in service all the time, and has the boiler settings in perfect condition, and also has automatic stokers and skilled supervision, percentages can be maintained as high as 16, but as exceedingly high CO_2 travels together with high combustion chamber temperature, a high CO_2 necessitates constant supervision and repairs to the combustion chamber, so that except in special cases where the

plant is provided with protection against high temperatures, overall economy of operation would be better with a maximum CO² of 15%.

76. High CO² also has another danger of loss. If insufficient air is provided in the combustion chamber some of the gas is not completely burned to CO², but one part of carbon attaches itself to one part of oxygen only or CO, and only one-third of the total heat of that portion of gas is given up. Therefore, you might have a maximum CO² figure but also a large volume of the gas which only had one part of oxygen available for its combination, which would mean a high fuel loss.

Therefore, in order to be safe it is more economical to operate the plants with from 13 to 14% CO². The maintenance cost of boiler upkeep is less and there is little liability of loss through unburned gas. A continual CO² record ranging from 12 to 14% is excellent general practice.

CO² and Practical Operation

77. The following table shows approximately the preventable fuel losses which are resulting while the CO² record is at the figure shown:

% CO ²	3	4	5	6	7	8	9	10	11	12	13	14	15	16
% Fuel														
loss too														
much air	50	35	25	20	16	13	10	8	6	4.3	3	2.1	1	Nil
% loss too														
little air												2	5	10

Coal for Hand Fired Boilers

78. Coal for hand fired boilers where fireman is on duty all the time in the order of their characteristic or service value:

- A. Bituminous or Semi-bituminous Nut.
- B. " Nut Pea.
- C. " Nut Slack.
- D. " Pea Slack.
- E. " Run of Mine, dust removed.
- F. " Run of Mine.

Bituminous lump should never be recommended for above purpose. It is not economically sound nor productive of good service.

- G. Black Lignite Nut mixed with Bituminous Slack.
- H. Sub-bituminous Stove Nut.
- I. " Nut.
- J. " Lump.
- K. " Nut Pea.
- L. Sub-bituminous Pea and Bituminous Slack mixed.
- M. Black Lignite Run of Mine with Pea screened out.
- N. Black Lignite Stove.
- O. " Nut.
- P. " Nut Pea.

Note: The purchasing prices might change their order from a point of economies at the plant.

79. It is not economical to burn Sub-bituminous Slack or Black Lignite Slack hand fired alone or along with larger sizes. The slack takes the life out of the fire, but if some bituminous slack is mixed with the slack of the other types it will create a lively fire.

Mixing Coals

80. It is good policy for consumer and dealer to "get to know" the action of a mixture of Black Lignite with Bituminous, or vice versa, experimenting with the mixture of different quantities of each. Practically every complaint of too slow, too fast, poor draft, too much draft, low rating and others can be cured with this mixture in varying proportions.

81. Bituminous coal is slow burning, cakes, requires high draft, requires poking. Black Lignite is fast, will burn in holes, requires low draft, must not be poked. As each has the reverse characteristic to the other, so each will tend to counteract any disadvantage of the other. The mixture forms a porous spongy mass that is free burning and does not require the use of the poker. Further, if either are inclined to clinker when used alone the mixture will prevent clinkering.

82. Wetting small coal will improve its firing characteristics. Some caking bituminous coals work better if fired very wet.

83. Canmore coal, which is on the border between Semi-anthracite and Semi-bituminous, if fired wet as concrete mixture, cakes into a spongy mass which is very free burning.

Wetting coal does not add any heat value to the coal, but by improving its burning characteristics it permits of more of the available heat being obtained than would be the case if used dry.

Clinker

84. If two coals of the same rank are mixed look for clinker troubles.

If two coals of different rank are mixed, neither of which are caking, look for bad clinker conditions.

If the fireman makes too free with the poker and stirs the ash with the hot fuel, look for clinker trouble.

If with a non-clinkering coal you have complaint of clinker, look for dirty grates or too thick a fuel bed.

Wetting small coal is a protection against clinkering, but is not a complete preventative.

COALS FOR DOMESTIC PURPOSES

85. The domestic coal consumer should not purchase his coal upon a B.T.U. basis. He does not know sufficient about B.T.U.'s to be able to judge its B.T.U. value to him. There are so many Alberta coals offered to the consumer that he cannot know them all. He can only expect to know, by actual using, the "domestic characteristics" of any coal.

We try to illustrate here the difference between B.T.U.'s and domestic virtues.

The lady illustrated in figure one is hired upon a B.T.U. basis. She has lots of weight, strong as a horse, plenty of reserve, and if her employer had the personal time at her disposal to lead her through her duties and to think for her, Katrinka would be a jewel for results. But suppose her employer has not got the time, nor desired to have it, "I no forstan'" would be a poor substitute for service, and very trying on the nerves.

Contrast Katrinka with the lady in figure two. There is not much of her, but she has "pep" and speed, and like a good coal would require the use of a damper occasionally, but once she got used to the ropes of the particular house she would not require much leading.



Figure 1



Figure 2

Therefore, as it is not usual to hire a "domestic" by weight, don't buy coal for its quantity of B.T.U.'s if it is the "Domestic" virtues which you require.

The advice to the coal dealer would be "not to talk B.T.U.'s to a person that cannot buy B.T.U.'s."

The perfect coal would be one that put itself into the furnace when and as required.

One that maintained an even heat at all times without attention.

One that regulated itself according to climatic conditions.

One that had no bad habits, "did not smoke," "did not breathe foul gases into the house," "one that was clean around the house and did not soot up the place." One that was speedy when speed was required. One that you could put the brake on if you desired. One having no ash to sift and carry, and having a long life. One that never went out.

The above are a few of the desires of the domestic coal buyer. The dealer should visualize this perfect fuel and compare his product with it so that he may answer the questions intelligently when put to him by his prospective customer. There is no such thing as a perfect fuel, but every dealer and coal producer should wish to have his customer believe that his particular coal is as perfect as is possible of any coal.

Taking a few leading complaints which has been thrown at the writer at various times and the replies:

COMPLAINTS

Coal Won't Last

86. "Mr. Alberta,—I tell my wife she put on coal every hour during day, but she not get up in night. She learn Canadian so she say 'up to me.' I hard working fireman wot fires little and often and tired I get, so I burn 'hard coal at night.' It cost me too much money. What for I do now?"

Reply:—"The first mistake you made was in telling your wife what she must or must not do; it isn't good policy. Second, little and often is bad policy for home heating. The house is improperly heated and it burns too much fuel."

"For one week get up half an hour earlier, shake the grate first thing, put on a little coal, open up the draft for 15 minutes. Then close the draft and fill the firepot with new coal, leaving one side hot so that the flame will continue. Padlock the ash pit door closed, hide the grate shaker and go to work. When you arrive home in the evening, go through the same performance and the same before going to bed."

"At the end of the week listen in to the wife telling you what a wonderful husband she has. You can then, if you like, 'ask' her to show you what a good fireman she will make."

Irregular Heat

87. The next complaint is from a person who objects to the house being hot at one time and cold at another.

In reply to questions he advises that he fills the firepot full of coal, opens wide the ash pit door and the damper, and goes upstairs. When wife advises him that it is getting too hot in the house he yanks the damper chain from upstairs and returns to his disturbed activity until he is told that the house is getting cold again, to which he replies with another "yank."

Furnaces cannot be operated in the same manner as a long distance telephone. The coal should be fired in same manner as instructed to first complaintant. Then disconnect the damper chains and operate without them for a week. Go down and look at the fire so that you will get to "know" it. At the end of the week put the chain back if you desire, but it is usually found that it is less trouble to operate the furnace from the furnace floor than at long distance. If fired properly the furnace should be checked at the time coal is fed and left at that.

Climatic Changes

88. With the Alberta domestic coals there should be no need to worry about changing firing methods according to climatic conditions.

During mild weather let the ash build up on the grate; do not shake the grates oftener than once each day. By getting to know what the dampers are for they can be set once for all weathers. The chimney is automatic in action according to the outside temperature. The only times that you should want to change the damper setting is to open it "only" while you are putting in coal or while forcing the fire after you have neglected it and allowed the house to become cool.

Smoke

89. The next complaint is on "smoke." The complaining party is asked if it smokes "all the time." His reply is that it is only after he puts on the coal. There is no need to ask him any more questions. You say to him:

"You shake the grates well. You then throw in a lot of coal all over the fire and open up the ash pit wide, and it smokes for about a half hour and puffs into the house through the fire door?"

Looking at you as if he believes that you are a "Wizard" he will say, "Yes, that's exactly the way I fire; I find it gives best results."

The following then ensues:

You—"The coal does not smoke all the time?"

Him—"No!"

You—"If the coal does not smoke all the time the coal will burn without smoke, and as the furnace operates sometimes without smoke it cannot be the fault of the furnace. Therefore it is reasonable to place the blame onto the manner that the furnace is operated."

He—"That does seem logical."

You—Smoke is the result of making gas too fast, so fast that it smothers the flame and in such large volume that the chimney is not big enough to take it all away. You know that the chimney is big enough for ordinary conditions, because it has taken care of the hottest fire that you have had.

“When you shake the grate you open up the fuel bed so that air can get at the burning coal to make it burn faster. When you open up the ash pit wide you make it burn faster still. The space over the fire (called the combustion space) is only large enough to burn a certain quantity of gas at one time. If you put in more than it will burn it is entirely smothered.

“If you had not shaken the grates so freely and not opened the ash pit door so widely you would not have made gas so fast and the combustion chamber would be large enough to burn it.

“Do not shake the grates so freely.

“Do not open the ash pit door.

“Do not cover all the fire with new coal.

“Heat will then be obtained at once without having to wait while you were driving off half the fuel value as smoke.”

Smokeless Coals

When the word smokeless is used in connection with coal it means that there is little visible smoke. In burning every fuel, the fuel is changed to a gas which is dangerous to life. The gas from one is no more nor less dangerous to life than the gas from another fuel.

All and every coal can be burned without visible smoke if the required attention is given to the fire.

Since the decline of the use of anthracite for home heating there has cropped up a series of coals which, although soft coals, are classified as “smokeless,” particularly in the U. S. A. These coals are not smokeless in the true sense of the word, but under fair conditions of operation they are less liable to create smoke and soot than other varieties.

Alberta has not made use of this definition to describe her coals up to the present, but the question is often asked whether or not certain coals are smoky.

Smokeless has a certain standard meaning when applied to coals produced in the United States, which under ordinary conditions do not have a sooty flame but throw off a white or grey haze.

These smokeless coals are found in two ranks, low moisture combined with low volatile, and high moisture combined with high volatile. In the Alberta domestic coals it can be said that coals are of the smokeless class when the moisture is more than 15%. Coals containing this amount of inherent moisture do not burn with a sooty flame.

Gas in House

90. The next complaint is foul gas gets into the house. This statement usually applies to a hot air furnace.

In 75% of hot air installations there is a leakage between the furnace parts and the casing (through which the cold air passes to be heated). The house acts as a chimney to draw the air to be heated through the casing. Consequently, there is an "in draft" into the casing in the same manner as there is into the furnace through the chimney draft.

Cause 1. If the chimney draft is checked too low the draft in the casing will be higher than the furnace draft, and so pull some of the gases from the furnace through the leaky joints. This will be more pronounced when very hot air is leaving the registers in the rooms. The hotter the air the higher the "draft."

91. Cause 2. Bad furnace installation. Many installations are made with cold air return pipes too small, or cold air registers that obstruct the passage of the air, further, some persons regulate the heat required by covering up the cold air registers in part or entirely.

The heat applied by the furnace to the air in the casing creates the "draft" through the hot air registers. If this "draft" cannot be supplied with air through the cold air returns it will draw the foul gases from the furnace through the leaky joints.

92. A few cases have been met where the chimney was so fouled with soot or so many chimney leaks that the house formed a better chimney, thus most of the gases off the fire were drawn through the leaky joints of the furnace into the air casing.

Don't have a leaky furnace.

Don't restrict the cold air.

Don't maintain a dirty chimney.

Don't have a leaky smoke pipe.

The preceding complaints are the cause of another complaint—uncleanliness around the house. If the conditions as set out in those are permitted to persist dirty walls and furnishings will result.

Soot and Tar

The next complaint will be that coal is sooty and tarry.

93. Soot and tar are formed through improper burning of coal. If the troubles as set out in the preceding cases are prevented there will be no soot nor tar. You cannot have either after the gas has been burned. It is entirely through letting them get away unburned that they have the properties of making tar and soot. The best preventative is to keep the chimney clean and at stated intervals brush out the furnace. Under proper furnace operation the chimney should only require cleaning at early spring and late

fall, about six weeks before the furnace is closed down for the summer, and six weeks after first lighting in the fall.

If the chimney and heating surfaces of the furnace or boiler are neglected the soot will build up very fast, and a few days' operation will foul them as badly as months under ordinary conditions.

Coal Burns Too Fast

94. Another complaint would be that the coal was too fast and would not stay in.

There were numerous reasons for this, the most common being:

That the person had been used to anthracite or coke and was applying the same draft regulation with the Alberta domestic coals.

Only about half the draft is required with the Alberta "domestic" as with anthracite. If too much is applied the coal gets too good a start, and is difficult to check once burning strongly.

95. Too much grate shaking is another reason. Spreading the coal all over the fire is another. Using coal too well selected in size is another cause of this trouble.

With a free burning coal only one side of the grate should be shaken at one time. The new coal should be piled high on the other side.

One or two lumps placed so that smaller coal will not roll down and smother all the flame, then filling in with broken pieces and small on the other side will maintain a fire which will give out even heat over a long period without the complaint of fast.

Coal Too Slow

96. The complaint of coal too slow usually comes after a person has become used to a certain class of coal which is faster. Often such a person has purchased with the idea that it was the same or similar coal. A slight increase in chimney draft or a slightly cleaner grate cures the trouble in such cases.

The majority of them, however, come through keeping a dirty fire. Ash and clinker have been left to build up and mix with good fuel. Dumping the fire and relighting is the best under such circumstances.

Some coals are slower than others, and require that during mild weather the grate to be shaken clean every day.

A mistake is usually made with a slow coal by trying to bring all the coal up to a quick heat at one time. The chimney can only supply a certain quantity of draft. If this draft is spread over the whole grate area and it also has a thick bed of coal to pull through, it is logical that it will be slow. A slow coal can be quickened up by deliberately plugging up half the grate so that no air can get through. This forces a higher pressure and larger volume through the other side and brings it to quick heat. The

heat from that soon ignites the coal on the plugged side and in a very short time a hot fire is obtained over the whole of the grate.

If a fire is burning too strongly and reduction of draft with closed ash pit door does not check the fire, take the shovel and pat the fire down so that the fuel will be closer. If this is not sufficient get some coal dust and place on one side of the fuel bed. Never cover the whole bed with coal dust when the fire is burning briskly. It is liable to cause an explosion.

Don't put ashes on the hot coal, it will cause clinker.

The ash from most of the Alberta domestic coals is fine. When shaking the grate or cleaning out the ash pit see that the dust chute damper is open so that the dust will be carried up the chimney.

If you have a hot water boiler sprinkle water with the hose through the opening in the ash pit door about ten minutes before taking out the ashes. This will prevent dust and the water will help the fire.

A quality held by the Alberta domestic coals that is held by few others is that it will not die out. There is no sifting of ashes because there is nothing to sift out. During mild weather a piece of coal may be put on one day which will just keep the desirable house temperature over the 24 hour period and have enough life left to start another piece on its way for the next 24 hours. To do this effectively the ashes should not be shaken down for several days. An advantage in holding a fire in this manner is that in the event of a sudden cold snap a shake of the grate, a knock on the fuel with a poker and draft will immediately make a hot fire.

Dealers or consumers wishing for pamphlets of instruction on methods of operation with the domestic coals can obtain them free of charge on application to the Alberta Government Coal Truth Office, Winnipeg, Man., or from Trade Commissioner, Alberta Government, Edmonton, Alberta.

Winnipeg, Canada,
June, 1926.

G. R. PRATT, A.M.E.I.C.,
Fuel Engineer.

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